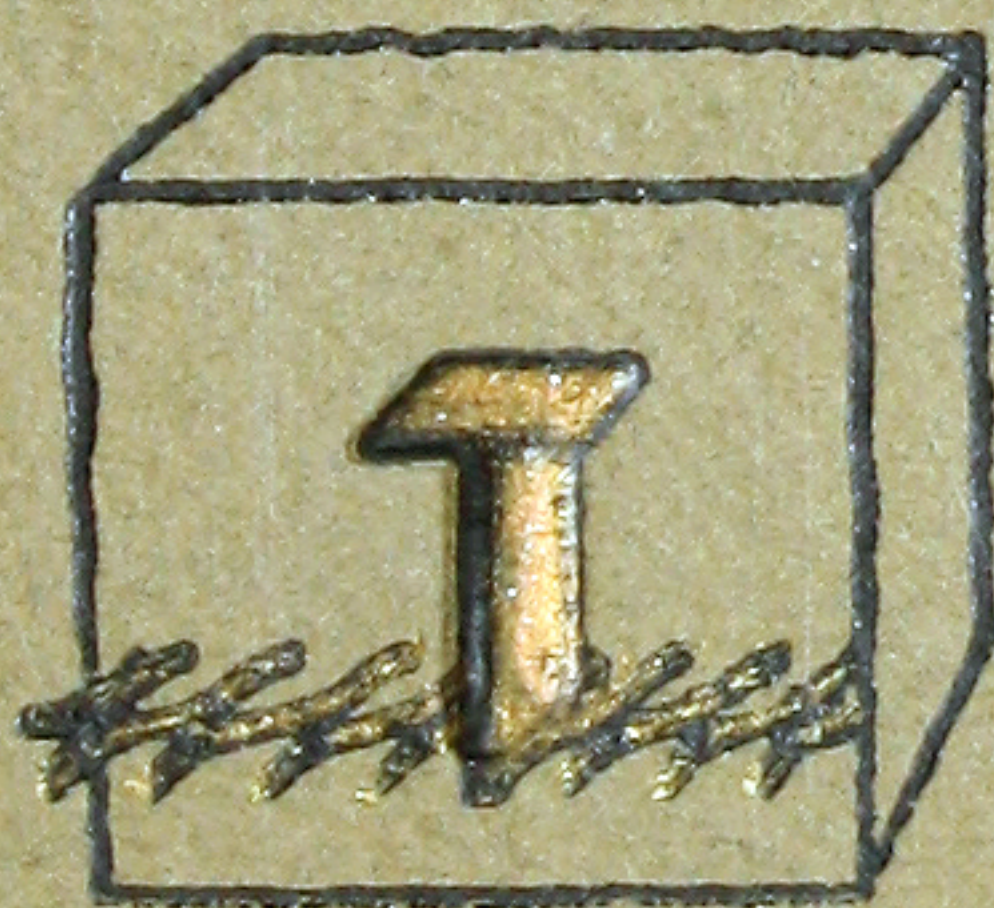


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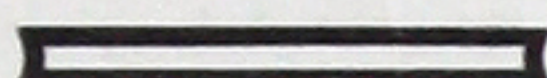
Hand Book
for
Formless Concrete Construction
using
T-Rib Chancelath



FRANKLIN INSTITUTE
PHILADELPHIA

STUTTGART MUSEUM
ALPHABET 1919

T-RIB CHANELATH



A material performing the functions of form and reinforcement in the construction of reinforced concrete roofs, floors, walls, tanks, culverts and all structures in which thin concrete slabs are used.

Also a combined lath and furring for partitions, ceilings, curtain walls and all types of plastering work.



Manufactured by the
North Western Expanded Metal Co.

407 S. Dearborn Street
Chicago, Ill., U. S. A.



1918

FOREWORD

FIRE resisting buildings are being built in increasing numbers each year. It is generally recognized that, aside from the value of fire protection, buildings of this type are more permanent and hence require much less outlay for upkeep.

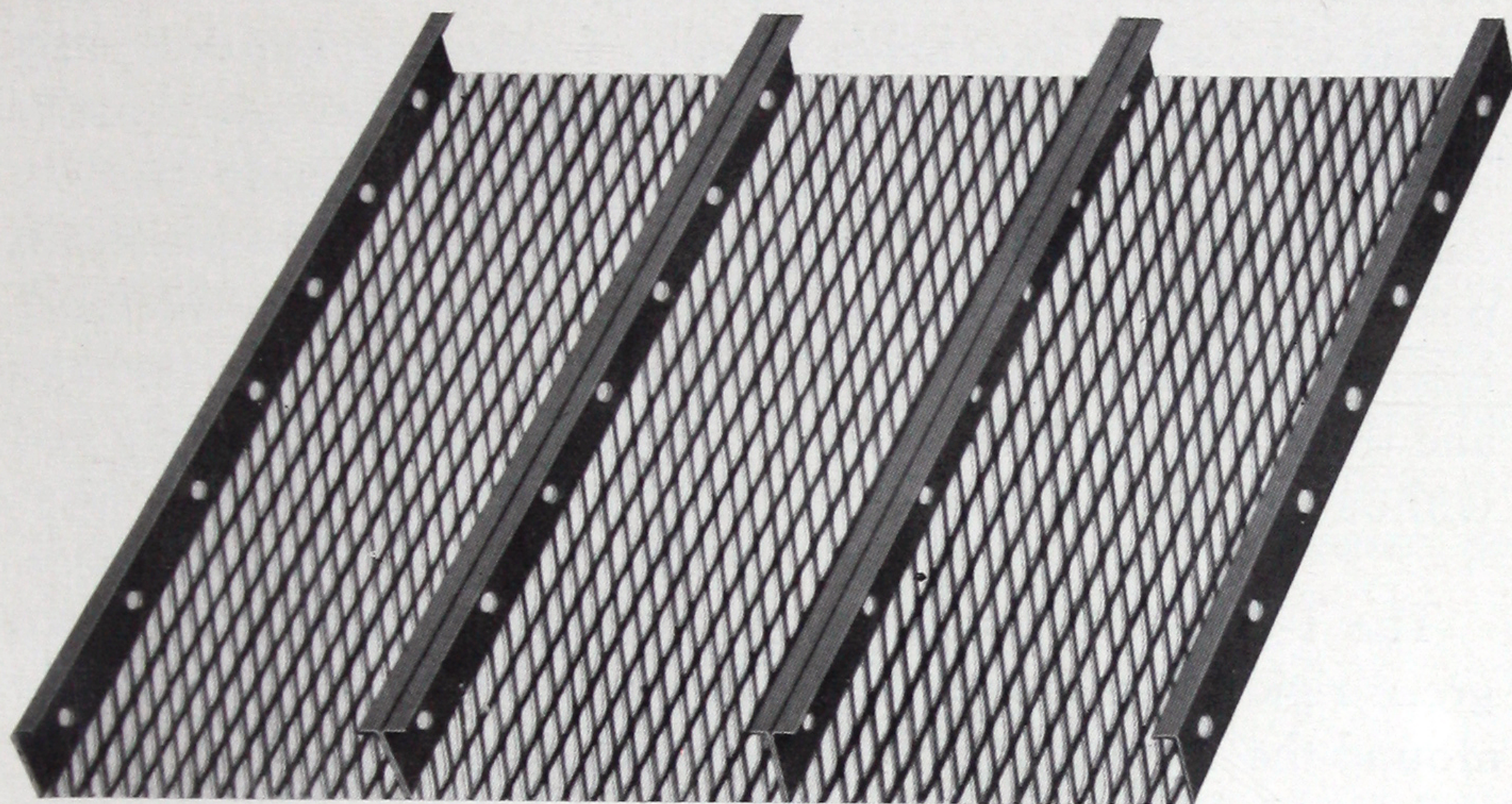
Reinforced concrete for floors and roofs is rapidly increasing in popularity for fire resisting buildings, because the difference in the ratio of expansion between concrete and steel is practically nothing, which is not true of any other combination of materials. Also because of the ease and rapidity of erection which the very latest improved methods make possible.

The elimination of nearly all the costly form work and the use of fabricated reinforcement reduce both the time and labor cost for reinforced concrete. How this can be most economically accomplished with T-Rib Chancelath is outlined fully in this book.

Plaster over metal lath for partitions, walls and ceilings is recognized as one of the most efficient types of fire resisting construction. The use of a combined studding, or furring, and metal lath saves time and labor cost for this part of the work.

The economy in using T-Rib Chancelath for plastered walls, partitions and ceilings and its adaptability to all types of buildings and engineering structures are outlined in detail in this handbook.

T-Rib Chancelath



A Section of T-Rib Chancelath

T-Rib Chancelath is a type of cold formed expanded metal comprised of T-ribs joined together by a steel fabric of diamond-shaped meshes. This mesh is practically the same shape and size as that of the well known Kno-Burn expanded metal lath.

T-Rib Chancelath is used in the construction of concrete floors and roofs and other reinforced concrete work where extreme rapidity of construction is desirable. When so used the mesh provides the necessary form work and the T-Rib the reinforcement.

When used in the construction of plastered walls, partitions and ceilings, the T-rib provides the studding or furring and the mesh the plastering surface.

T - R I B C H A N E L A T H

T-Rib Chancelath in Concrete Construction

Chancelath offers to the concrete constructor a combined form and reinforcement for concrete slabs. It entirely eliminates the use of expensive wooden forms and requires only supports of such a temporary character that they are usually removed as soon as the concrete has set sufficiently hard to carry its own weight. The sheets of Chancelath are placed in position and the concrete is poured directly upon it—the mesh is so small that it does not allow the concrete to pass through and the heavy T-ribs support the mesh and concrete rigidly and without undue deflection.

The T-Rib of Chancelath is solid and the wide flange gives a great rigidity to it laterally. The concrete flows completely around the T-Rib and imbeds it thoroughly. Both sides of the web are in direct contact with the concrete, thus insuring an absolutely perfect bond. Ample protection to the metal in the rib is assured because it is completely imbedded in the concrete even if the plaster coat on the under surface of the lath should be omitted.

T-Rib Chancelath in Plastering Work

Chancelath offers to the plasterer a one-piece lath and furring for ceilings and walls, and a combined lath and studding for partitions and curtain walls. It enables him to complete his work in less time because it eliminates entirely all auxiliary furring and studding. Chancelath can be erected quicker than any metal lath because the sheets are larger than those of any other product used for this purpose. The largest sheets of Chancelath are 4 feet wide by 12 feet long. This insures easy and rapid erection with the smallest possible number of joints. The plastering surface or mesh is the well-known "Kno-Burn" metal lath—the most popular and widely used metal lath in

T - RIB CHANELATH

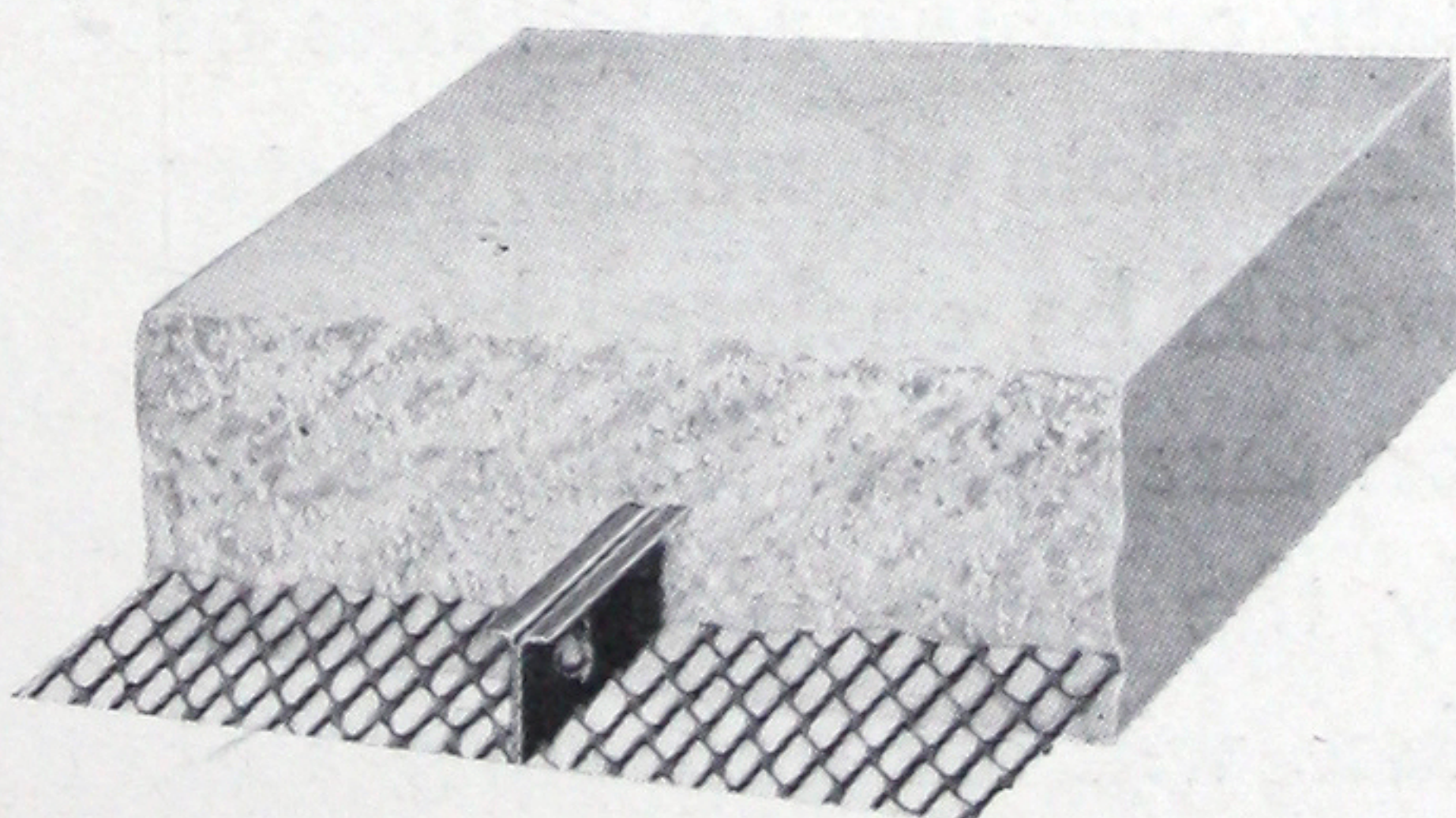
existence—and the rib is connected to the lath in such a manner that it does not interfere in the slightest way with the application of the plaster.

The mesh of Chanelath, being small and diamond-shaped, insures a perfect “key” when the material is used as a base for plastering work. It is so shaped that the wet plaster flows through the meshes and spreads out on the reverse side in little knobs like rivets. When Chanelath is used for solid partitions, these “keys” furnish a perfect clinching surface for the plaster to be applied on the reverse side of the lath. This makes it absolutely certain that there are no voids or pockets in the wall. The solid ribs of Chanelath make the plastering surface continuous, thus insuring the rapid and easy application of the plaster, as there is nothing to catch the trowel.

Distinctive Advantages of the T-Rib

The cold working of the metal in the forming of the ribs of Chanelath makes the T-rib a particularly efficient reinforcement, because it raises the elastic limit. The factor of safety in reinforced concrete design is determined by the elastic limit of the steel, hence the higher the elastic limit the greater the factor of safety.

It is a well known fact that any form of reinforcing which does not permit the concrete to flow around it has but a very slight value as a reinforcement. The mere adhesion of concrete to plain steel surfaces will not carry any great stress. The T-rib of Chanelath permits the concrete to flow completely around it, forming a bond that cannot be surpassed. This is clearly shown in the accompanying illustration.



The bond of concrete to T-Rib
Chanelath

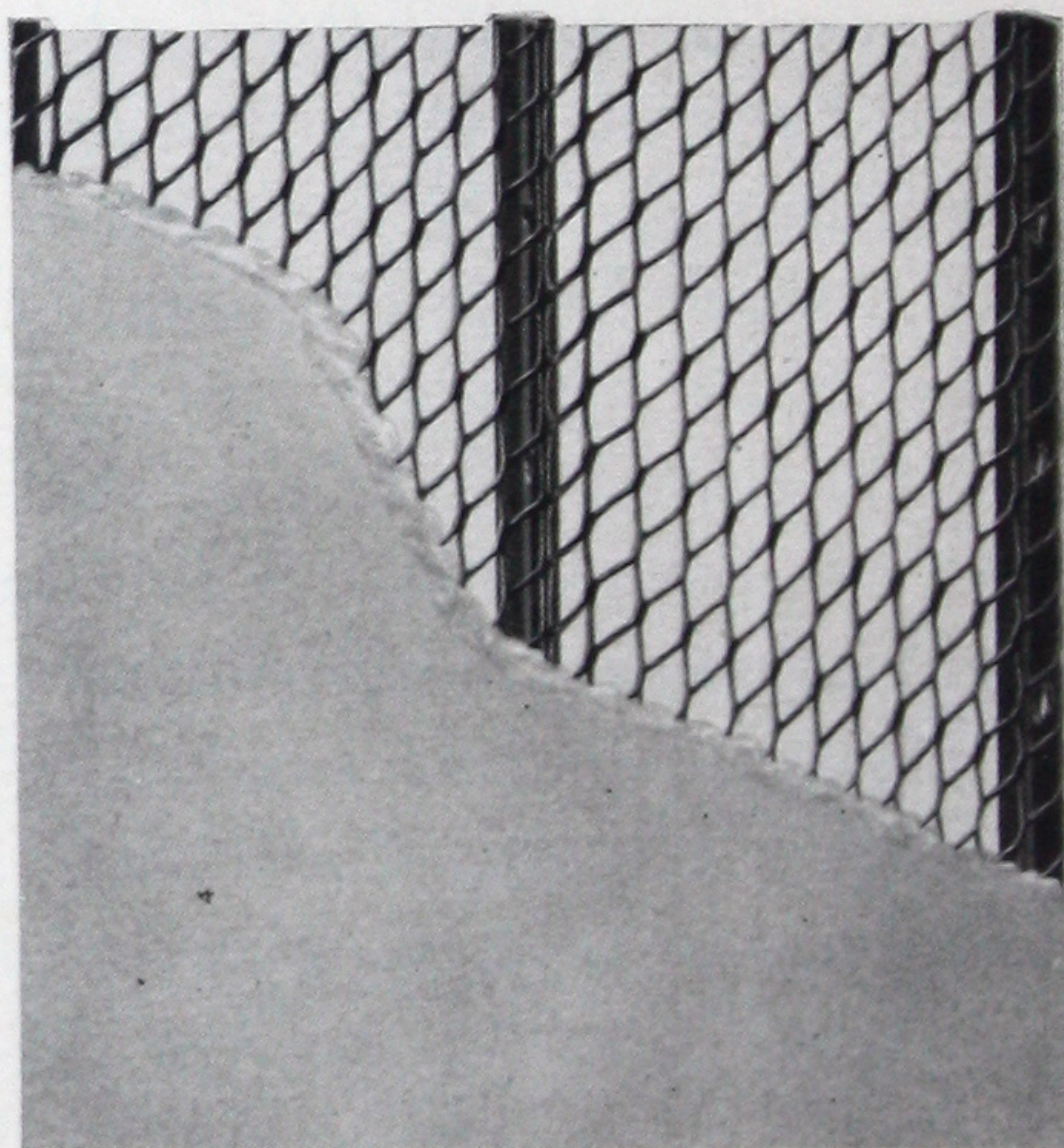
T - RIB CHANELATH

In order to secure the full value of any steel section used for reinforcing concrete, it must be entirely encased in the slab, but as close to the bottom as possible. The T-shaped rib of Chanelath fills these requirements perfectly. The T is completely imbedded yet the center of gravity is very close to the bottom of the slab.

The T-Rib in Plastering Work

It is a well known fact that to secure the best results in plastering work, the lath must be of a form that insures a good "key" or "clinch" over its entire surface. One of the special advantages of the closed T-rib of Chanelath is that there are no breaks in the plastering surface. There is not the smallest part of an inch of the surface of Chanelath which does not provide for a perfect "key." (See illustration on this page.)

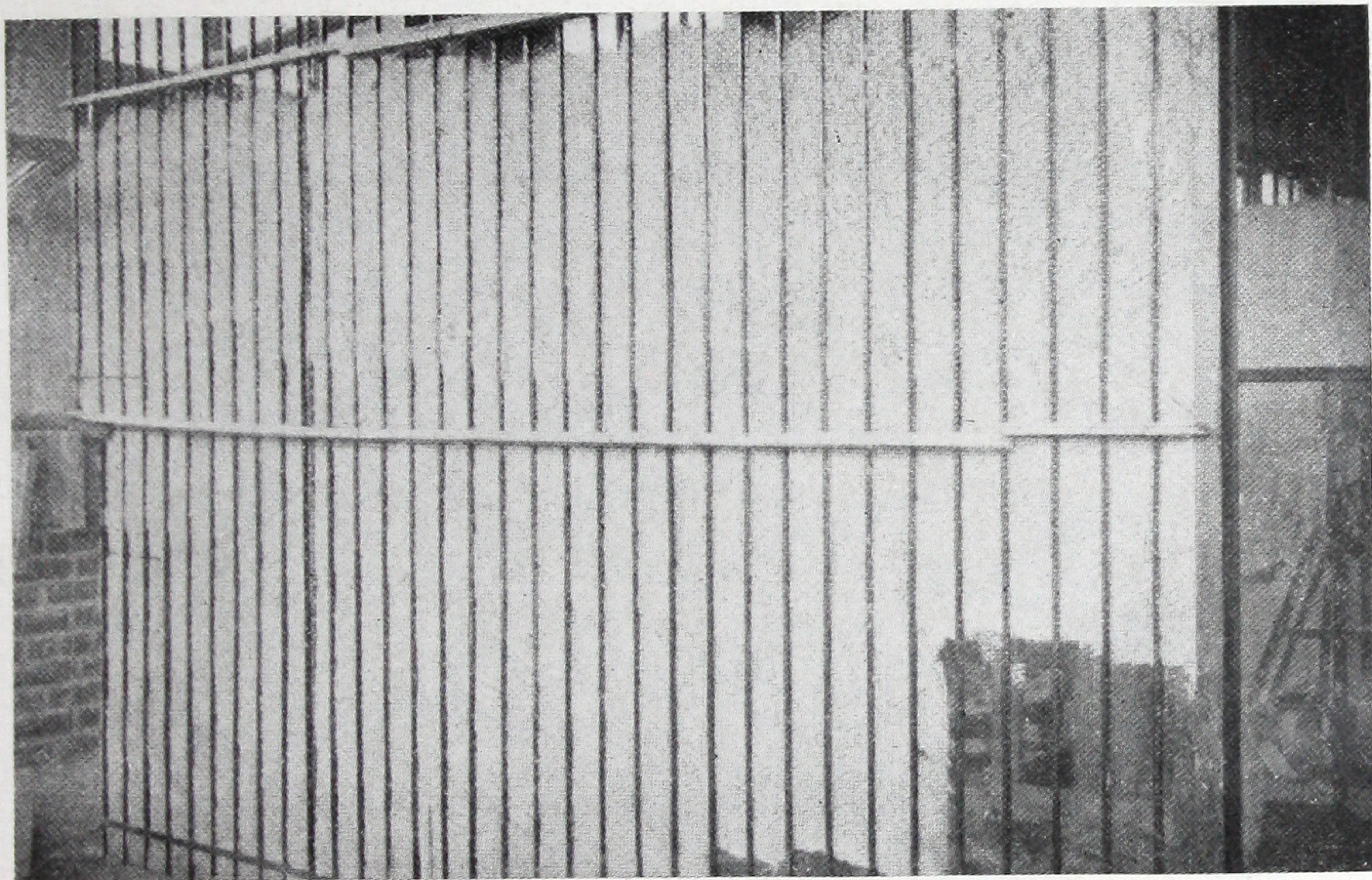
Plaster of any kind must be in contact with the air if it is to set evenly, otherwise the portions not exposed to the air will set slower than the balance and cracks will appear. The T-rib of Chanelath contains no pockets or deep slots where the plaster would be enclosed by steel on three sides. Consequently the entire plastered surface will set uniformly and cracks following the line of the rib are prevented. (See illustration on this page.)



**Plaster applied over T-Rib
Chanelath**

T - RIB CHANELATH

When both sides of the lath are to be plastered, the plaster is applied to the lath side (reverse of the rib side) first. The wet material is pushed through the mesh and forms knobs on the reverse side. When the first coat is applied to the reverse side these knobs furnish an uninterrupted key over the entire surface, there being only the very slight thickness of the T-rib between the different sections, and no portions of unexpanded metal. (See illustration of plastered partition.)



T-Rib Chanelath Partition, first coat of plaster applied

Distinctive Advantages of the Chanelath Mesh

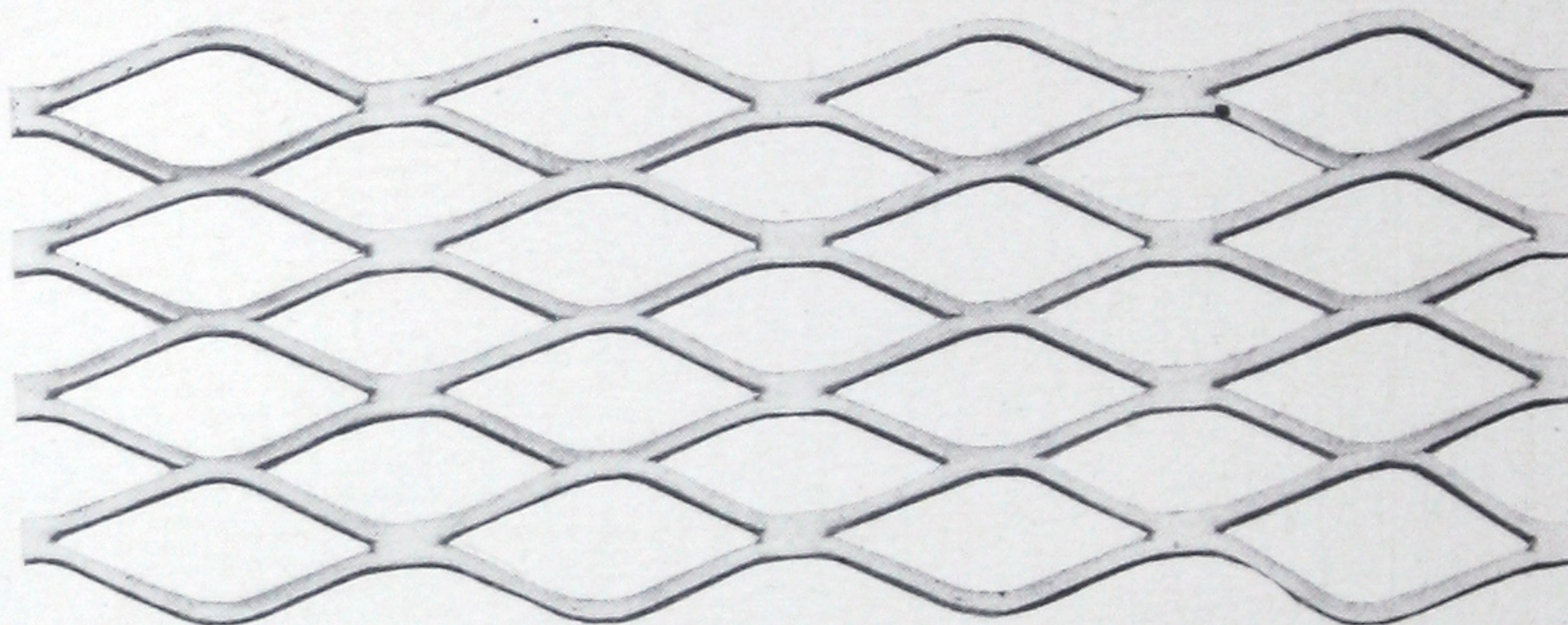
In reinforced concrete the small mesh of T-Rib Chanelath is of particular advantage as a form because it is so small that the wet concrete will not pass through the openings. The amount of wet concrete which will seep through the mesh is so little as to be negligible and is no more than that lost through the usual wooden forms. (See seepage tests of slabs on pages 37 and 38.)

T - RIB CHANELATH

The combining of a form and a reinforcement for concrete work permits the use of reinforced concrete for many purposes where it has heretofore been impractical owing to the difficulty in placing and removing the forms, as for instance, porch floors, covers for small conduits, culverts, floors of steel bridges and roofs.

The Mesh in Plastering Work

The fabric or metal lath portion of Chanelath is so designed that the mesh is approximately diamond-shaped and very similar to the mesh of our "Kno-Burn" lath. The actual size of the mesh is shown in the accompanying illustration.



Mesh of T-Rib Chanelath—Actual Size

The small diamond-shaped mesh is conceded by plasterers to be the most suitable mesh for any kind of plastering work because it prevents the use of an excessive amount of plaster and provides the best "key."

The strands forming the meshes of Chanelath are so placed in relation to the ribs, and the mesh itself so shaped, that it is equally easy to apply the plaster if the Chanelath is placed with the ribs either vertical or horizontal.

T - R I B C H A N E L A T H

Data for Specifying and Ordering

Size of Sheets.—T-Rib Chancelath is manufactured and carried in stock at our Pittsburg factory ready for immediate shipment in the following sizes of sheets: Lengths—3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 feet. Widths—4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44 and 48 inches. (2 foot widths are the most easily handled.)

Special Sizes.—For information regarding sizes of sheets other than those noted above or for irregular or special sizes, write to our general offices at Chicago.

Quality of Steel.—T-Rib Chancelath is manufactured from a special grade of medium steel sheets. It is also manufactured from galvanized sheets and from pure iron and copper-bearing sheets **on special order.**

Detail Dimensions.—Height of rib, $\frac{7}{8}$ inch. Spacing of ribs, 4 inches, center to center. Width of flange, $\frac{1}{2}$ inch. Size of mesh, $\frac{3}{8}$ inch by 11-16 inch.

Weights and Areas

Gauge.	Weight, Painted.	Weight, Crated.	Effective Sectional Area per Foot of Width.
28	.56 lbs. per sq. ft.	.70 lbs. per sq. ft.	.152 sq. in.
26	.67 lbs. per sq. ft.	.82 lbs. per sq. ft.	.183 sq. in.
24	.89 lbs. per sq. ft.	1.07 lbs. per sq. ft.	.244 sq. in.

Paint.—T-Rib Chancelath is always shipped painted unless specifically ordered unpainted. The painting does not interfere with the reinforcing value of the material because of the superior mechanical bond due to the T shape of the rib. A special grade of black paint of the asphaltum type is used and the material is thoroughly and evenly coated.

T - RIB CHANELATH

Data for Ordering and Specifying—Continued

Clips.—Suitable clips for attaching T-Rib Chanelath to structural steel can be furnished if specifically ordered. (See page 12 for detailed description of clips.)

Rib Cutter.—A rib cutter for cutting T-ribs will be furnished at a nominal charge if specifically ordered. (See page 71 for description of this tool.)

Punch.—A punch for making side and end connections will be furnished at a nominal charge if specifically ordered. (See page 72 for description of this punch.)

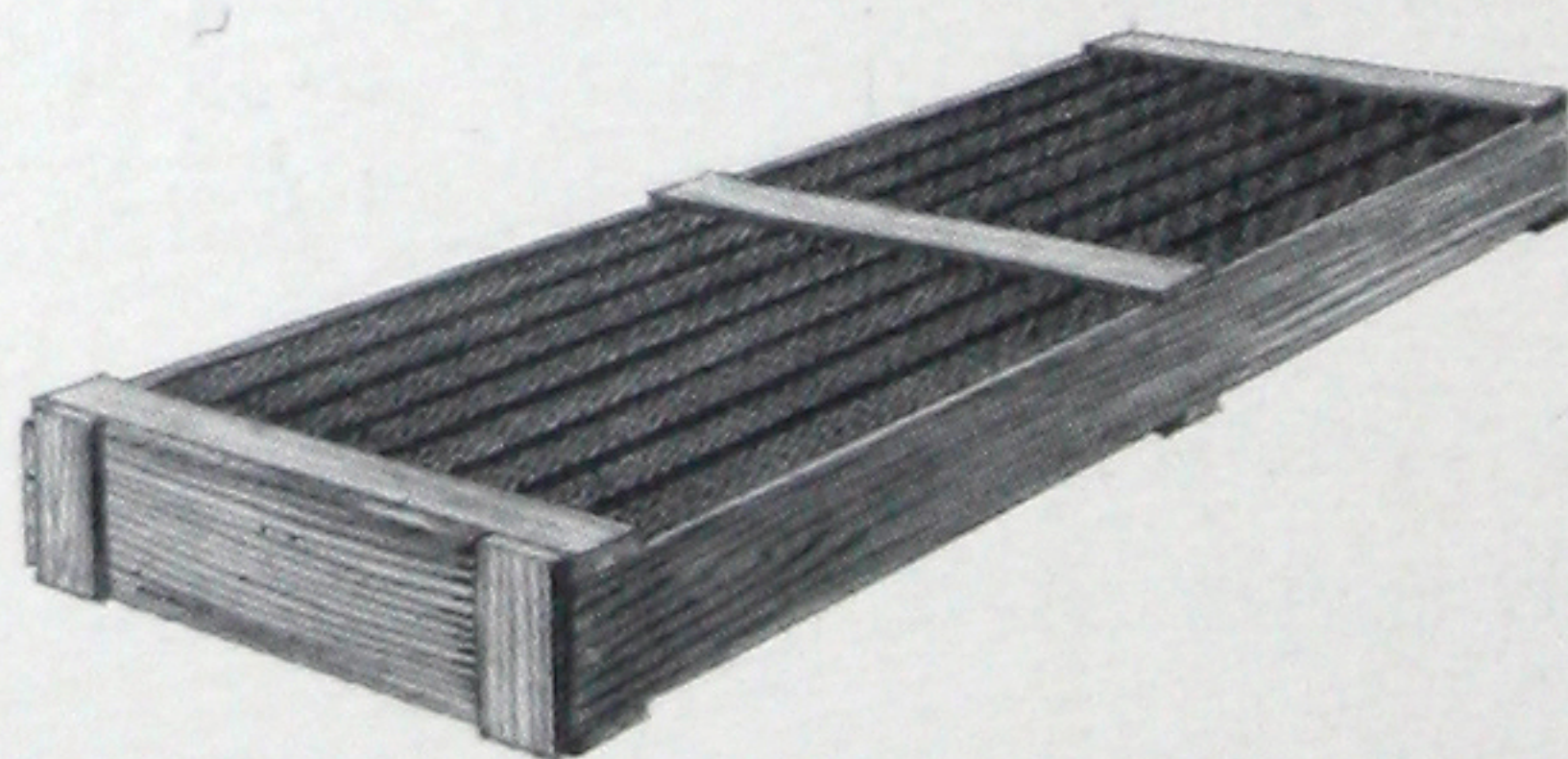
Splicing.—Chanelath sheets can be furnished with the ribs arranged for end splicing by opening on one end and flattening the flanges of the rib on the other end, as shown on page 11. **Sheets will only be furnished arranged in this manner when specifically ordered from the factory.**

Curved Chanelath.—Chanelath can be obtained from the factory, curved to any radius 24 inches or over, with the ribs on the outside of the arc, at a very slight charge. In ordering curved Chanelath, be certain to give the following information:

The radius and the length around the arc; or,

The radius and the chord or span of the arc; or,

The rise of the arc at the center of the span and the length of the chord or span. See page 73.



T-Rib Chanelath crated for shipping

Crating.—All T-Rib Chanelath is packed for shipment in skeleton crates with ends and sides thoroughly protected.

T - RIB CHANELATH

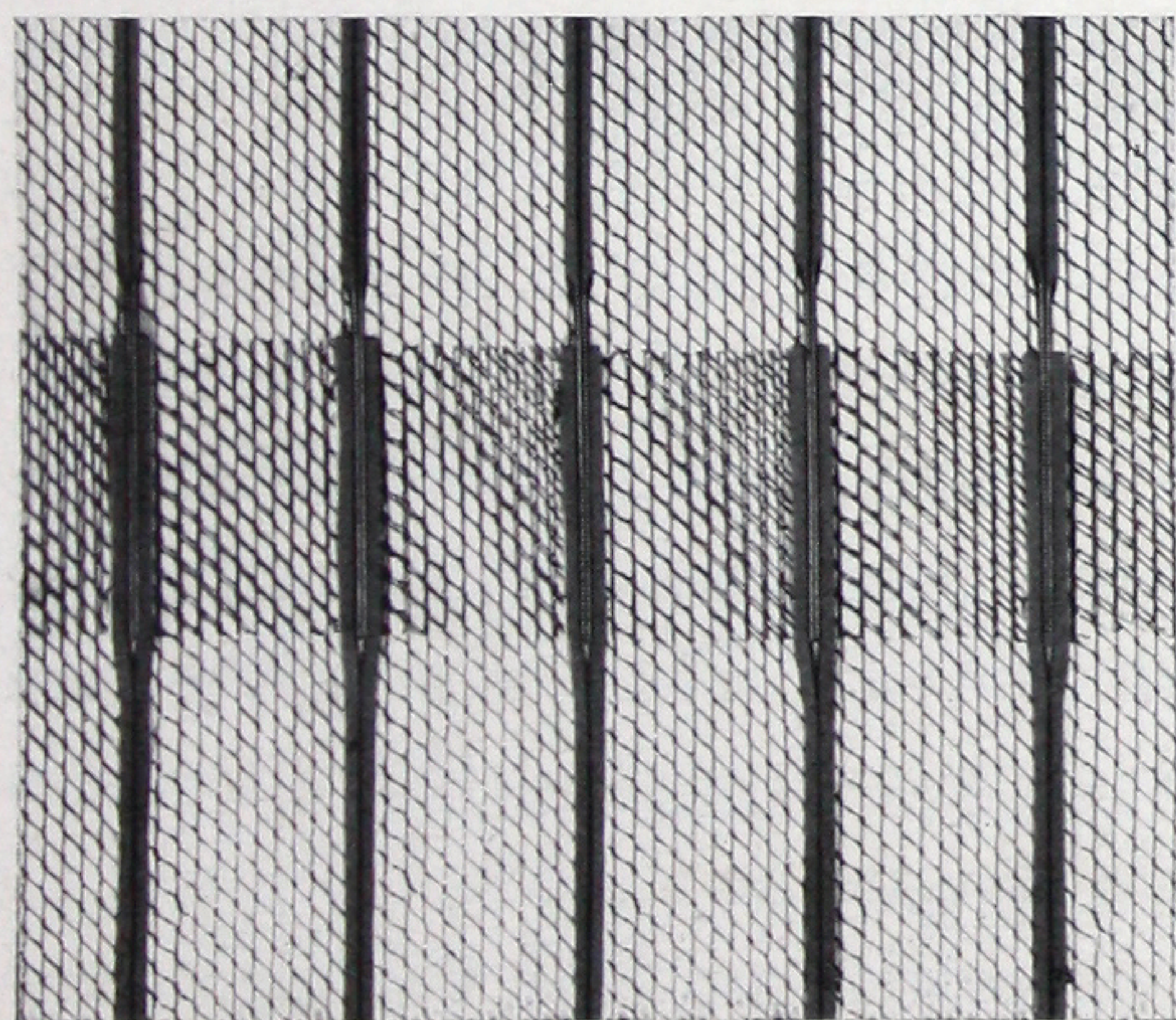
Data for Erecting T-Rib Chanelath

Splicing

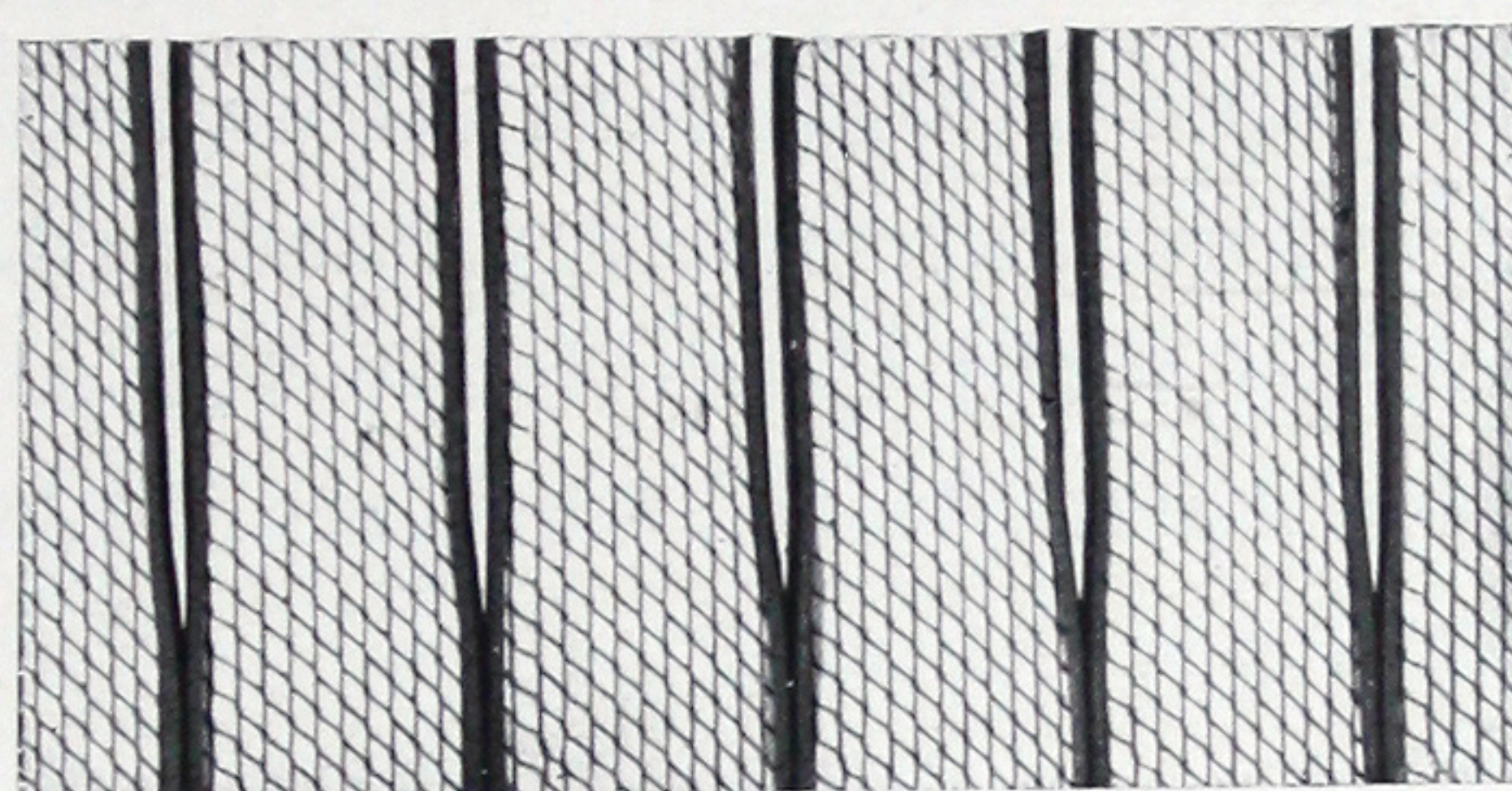
On some jobs it is necessary to splice the sheets of Chanelath. Various methods have been followed, but the best is to have the sheets prepared at the factory, as illustrated on this page. (See also page 10.)

The T-ribs on one end of the sheet are opened up for a distance of about 6 inches back from the end. The opening is only made wide enough to admit the flattened ribs on the opposite end of the corresponding sheet.

In making the splice, the flattened ribs on the end of one sheet are inserted in the opened ribs of the other sheet, as shown in the illustration below. The ribs forming the splice are then securely fastened together with No. 18-gauge tie wire or punched with the Chanelath punch.



or punched with the Chanelath punch.



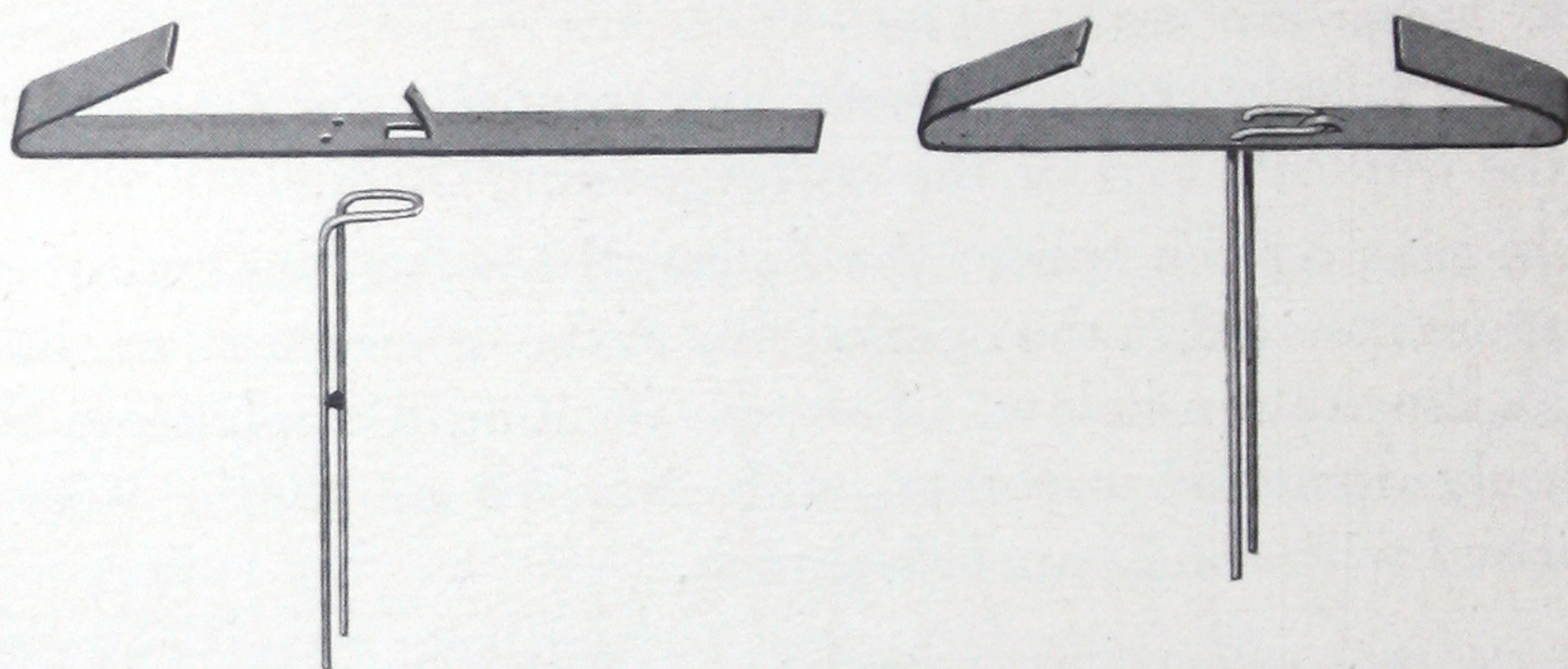
Another method of splicing adopted by some contractors is to butt the sheets of Chanelath and place a short piece of channel or flat alongside each T-rib, allowing one-half of the piece to lap over on each sheet. The channel or flat is then securely wired to the T-rib with No. 18-gauge tie wire

T - RIB CHANELATH

A third method is to cut the mesh away from the side of the T-rib on the end of one of the sheets to be spliced, for a distance of about 6 inches from the end. The other sheet to be used in making the splice is not cut. The two sheets are then slipped together with the cut sheet back of the uncut sheet, and the T-ribs wired or punched together.

Fastening T-Rib Chanelath to Steel Beams or Purlins

When T-rib Chanelath is used for reinforcing concrete roofs or floors and for suspended ceilings it is often a saving of time to use some type of clip for fastening to the structural steel. The illustration below shows one type of clip used for this purpose.



T-Rib Chanelath Clip

This clip has two parts, the flat iron section to fit around the flanges of the beam or purlin and the bent "hair pin" of number 14 gauge wire which is twisted around the T-Rib of the Chanelath. These clips are shipped unassembled and with one end of the flat shaped as shown above. They are easily and quickly assembled on the job by simply dropping the wire into place and bending down the little tongue as shown.

To erect these clips, place the formed end of the clip over one flange of the beam and bend the other end into place.

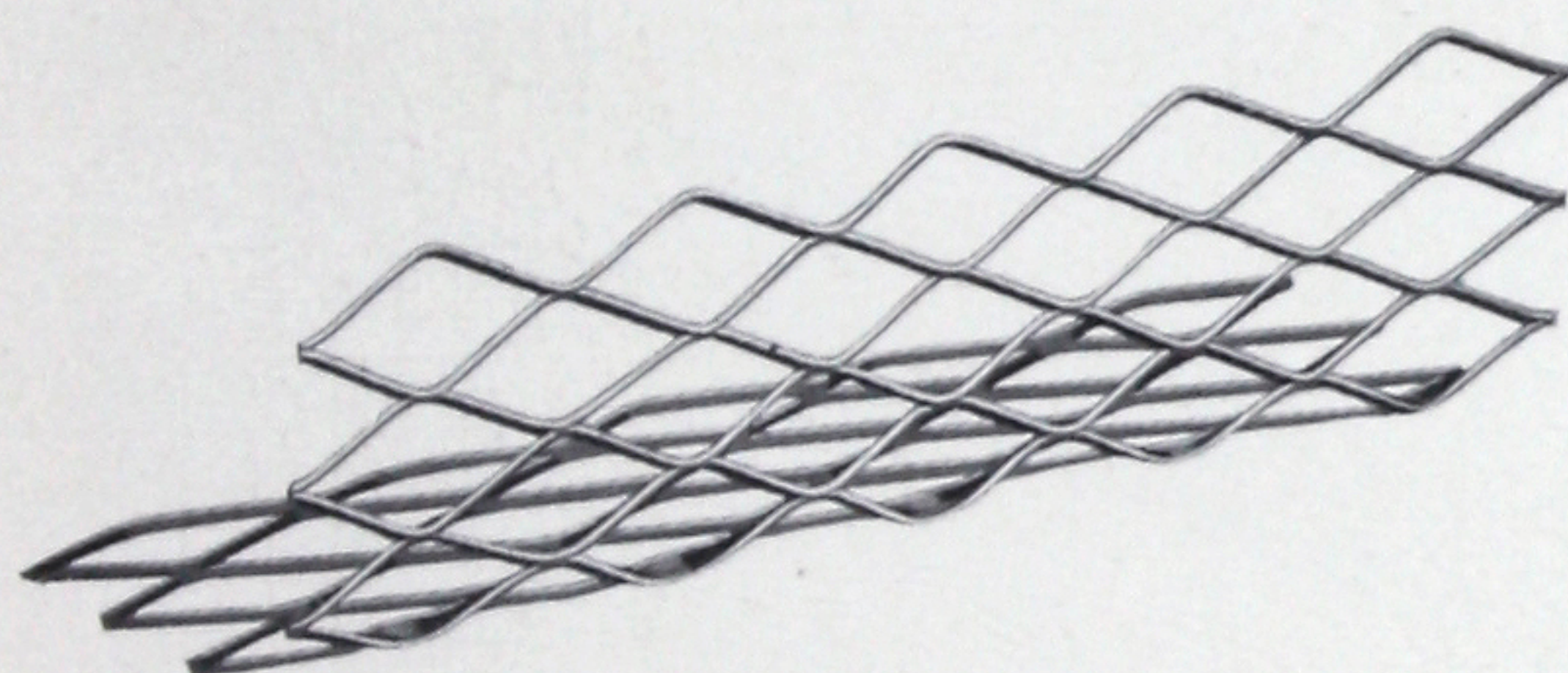
T - RIB CHANELATH

In estimating the number of clips required for reinforced concrete roofs and floors, one for every fourth rib will be sufficient but they should be staggered on alternating beams or purlins.

For ceilings one clip should be used for each T-rib. The same is true when T-rib Chanelath is used for walls or partitions.

Some contractors prefer to make their own clips by forming a flat to fit around the flanges of the beam and tying the T-ribs to this flat by 18-gauge tie wire same as that used ordinarily in the erection of flat sheet lath. Where this is done the directions given above for the number of clips to use should be followed in erecting the Chanelath.

Expanded Metal Runner Angle for Erecting Partitions



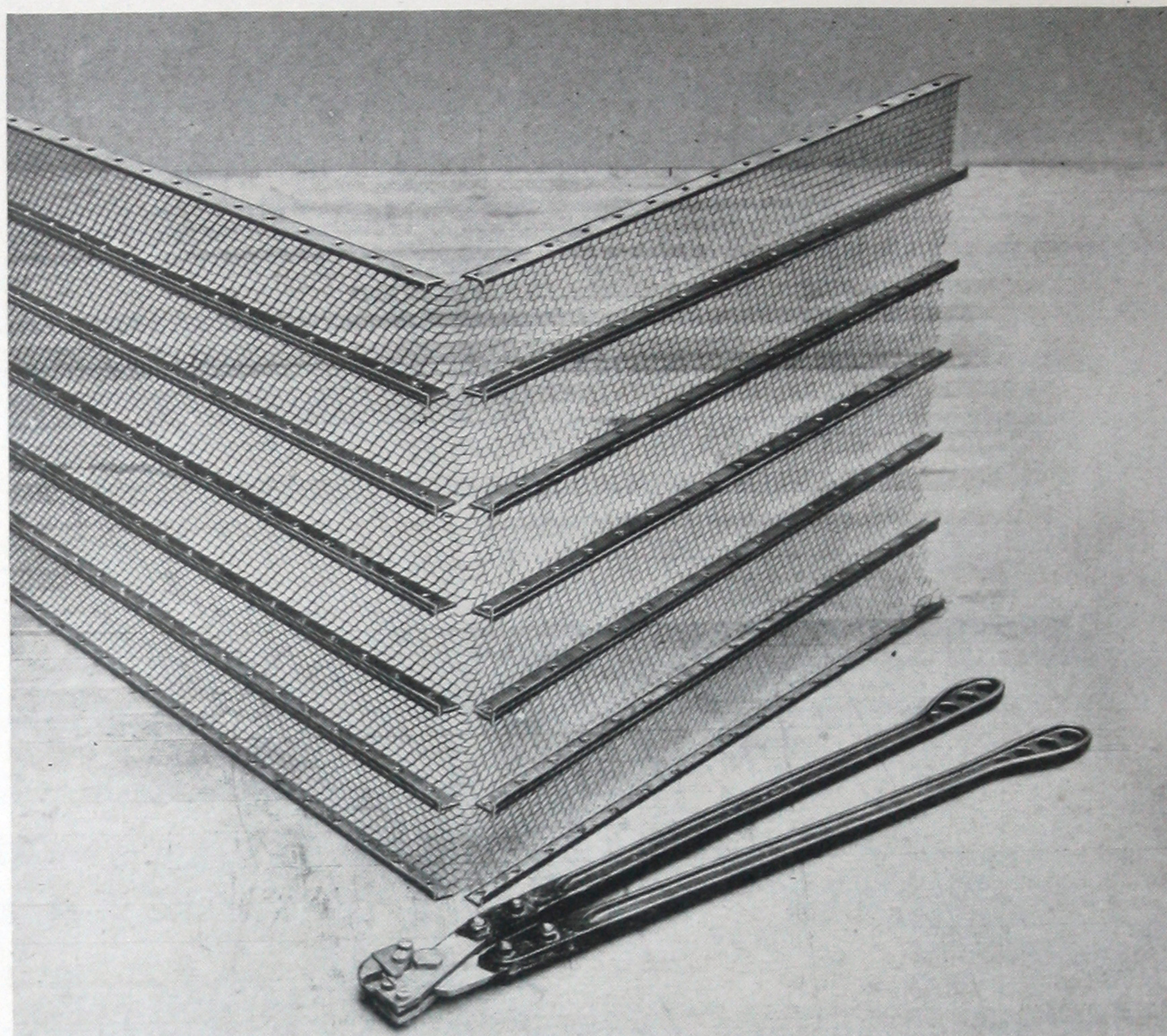
In using Chanelath for the construction of solid plaster partitions, a simple and efficient method of attaching the material to the floor and ceiling is by means of the expanded metal runner angle, illustrated on this page.

This angle is made by bending a strip of expanded metal along its center line to form an angle. One leg of this angle is embedded in the concrete if the floor is constructed of that material, or stapled to the floor if other types of floors are used. The Chanelath is fastened to the upstanding leg by wiring at every T-rib with No. 18-gauge tie wire.

The same method is followed if the runner is to be used at the ceiling. There are several other methods used in the construction of solid plaster partitions that are excellent. (See page 54.)

T - RIB CHANELATH

Forming Corners



To prevent the cracking of plastering at angles and corners, the lathing should extend without a break to at least the first support beyond the corner or angle. T-Rib Chanelath can be shaped to fit around any corner or angle by cutting the ribs with the rib cutter described on page 71. The illustration on this page shows a sheet of Chanelath formed to fit a corner, with the ribs on the outside of the corner. It can just as easily be formed with the ribs on the reverse side. Another advantage in using Chanelath in this manner is the ease with which metal corner beads can be fastened to the lath.

T - R I B C H A N E L A T H

Designing Data

Concrete slabs reinforced with T-Rib Chancelath are designed in exactly the same manner and with the same formulas as slabs reinforced with rods. Chancelath is manufactured of the best grade of medium steel and is subject to the same working stresses and conditions that any reinforcement undergoes. In Chancelath the steel is rolled into a more efficient shape, and it is due to the shape of the material and the cold working of the steel that Chancelath is able to perform the functions of reinforcement and form at the same time.

Formulas.—The formulas given below are all that are necessary to determine the thickness of floor slabs and the area of steel required for reinforcing those slabs. Slabs are considered as beams 12 inches wide. These are known technically as straight line formulas. An explanation of the derivation of these will be found in Turneaure and Maurer's "Principles of Reinforced Concrete Construction."

BM = Bending moment = M = Resisting moment (inch pounds). For foot pounds divide by 12.

R = Moment factor (dependent on the percentage of steel used).

f_c = Concrete fibre stress. (Compression.)

f_s = Steel fibre stress. (Tension.)

k = Depth to neutral axis } d of %

j = Moment arm = $1 - \frac{1}{3}k$

d = Depth to center of steel

b = Breadth of beam (12" for slabs)

A = Area of steel

p = Percentage of steel = $\frac{A}{bd}$

T = Total tension in the steel.

C = Total compression in the concrete.

n = Ratio of moduli of steel and concrete

$k = \sqrt{2pn + (pn)^2} - pn$

T - R I B C H A N E L A T H

$$p = \frac{\frac{1}{2}}{\frac{f_s}{f_c} \left(\frac{f_s}{nf_c} + 1 \right)}$$

$$M = Rbd^2, d = \sqrt{\frac{M}{Rb}}, b = \frac{M}{Rd^2}, bd^2 = \frac{M}{R}$$

$$M = f_s p j b d^2 = f_s A j d \text{ (in inch pounds for steel).}$$

$$M = \frac{1}{2} f_c k j b d^2 \text{ (in inch pounds for concrete).}$$

$$T = C = \frac{M}{jd}, f_s = \frac{T}{A}, f_c = \frac{2f_s p}{K}$$

L = Span in feet center to center of supports.

= Distance from center of gravity to load support for cantilever beams.

P = Concentrated load at center of span.

W = Total distributed load on beams.

w = Load per square foot.

B = Total weight of beam.

For beams resting freely upon supports at both ends.

$$BM = \frac{WL + BL}{8} = \frac{wL^2 + BL}{8} = \frac{PL}{4} + \frac{BL}{8} \text{ (ft. pounds)}$$

For continuous beams (with both ends fast) use 12 instead of 8 for a divisor.

For partially continuous beams (with one end fast, other end free on support), use 10 for a divisor.

Slabs are calculated as beams 12" wide.

For Cantilever Beams:

$$BM = \frac{WL}{2} + \frac{BL}{2} = \frac{wL^2}{2} + \frac{BL}{2} = PL + \frac{BL}{2}$$

Using 16,000 lbs. fibre stress in steel:

$p = 0.0087$ with 700 lbs. max. fibre stress in concrete.

$$BM = 10bd^2; b = \frac{BM}{10d^2}; d = \sqrt{\frac{BM}{10b}} \text{ (BM in foot pounds).}$$

$p = 0.0068$ with 600 lbs. max. fibre stress in concrete.

$$BM = 8bd^2; b = \frac{BM}{8d^2}; d = \sqrt{\frac{BM}{8b}} \text{ (BM in foot pounds).}$$

T - RIB CHANELATH

$p = 0.0051$ with 500 lbs. max. fibre stress in concrete.

$$BM = 6bd^2; b = \frac{BM}{6d^2}; d = \sqrt{\frac{BM}{6b}} \quad (BM \text{ in foot pounds}).$$

$p = 0.003$ for cinder concrete; max stress 300 pounds.

$$BM = 4bd^2; b = \frac{BM}{4d^2}; d = \sqrt{\frac{BM}{4b}} \quad (BM \text{ in foot pounds}).$$

Bond.—The rivets and mesh of T-Rib Chanelath each obtain a tremendous grip upon the concrete. The mechanical bonding surface per square foot of Chanelath is 145.37 square inches, or about five times that of $\frac{3}{8}$ -inch round rods, spaced to give the same sectional area. In addition to the mechanical bond, there is the bond due to the adhesion of the concrete to steel. The total for both mechanical and plain bonding surfaces is 243 square inches per square foot of Chanelath.

Lap.—If 100 pounds per square inch of mechanical bonding surface is allowed, the entire stress in 24-gauge Chanelath will be transferred from one sheet to another with a lap of 3 inches. We recommend, however, that the lap be never less than 6 inches, except where it is over the support. A mechanical operation in our plant permits of our opening the ends of the ribs for a distance of 6 inches, curling down the flange of the opposite ends of the sheet which is adjacent to it, thus permitting a male and female joint to be made for all end laps. (See page 11.)

Side laps are made by merely bringing the sheets together so that the channels are back to back, forming the T-rib, and punching them together with the Chanelath punch. The Chanelath punch at each operation securely locks the ribs together by crimping back the metal cut from the hole which it punches—the strength of every one of these crimp connections is equivalent to six of the rivets which ordinarily connect the ribs. (See page 72.)

T - RIB CHANELATH

Table of Safe Loads for T-Rib Chanelath Slabs

Assumptions:

- Stress in steel not over 16,000 pounds per square inch.
- Stress in concrete not over 650 pounds per square inch.
- Ratio of moduli of elasticity equals 15.
- Center of gravity of steel is .303 inch above bottom of mesh.
- Bending moment equals $wl^2 \div 10$.

The weight of the slab as given in the third column includes the weight of the plaster coat on the bottom or underside of the Chanelath.

(Note.—This table was prepared by a well-known consulting engineer of unquestionable ability, in accordance with the recommendations of the best engineering authorities. It is absolutely accurate.)

Total Thickness of Slab Bottom of "Chanelath" to Top of Concrete.	Gauge of "Chanelath."	Weight of Slab per Square Foot.	Area of Steel in Square Inches per Foot of Width.	Percentage of Steel.	Moment of Resistance, Foot Pounds per Foot Width.	Safe Live Loads—Lbs. per Sq. Ft.							
						Length of Span in Feet							
						3'	4'	5'	6'	7'	8'	9'	10'
2"	24	30#	244	1.198	360	370	195	114	70	43			
	26		183	.898	325	331	174	100	62	36			
	28		152	.746	302	306	159	91	54	31			
2½"	24	36#	244	.925	550	574	308	183	116	76	50		
	26		183	.694	470	487	258	152	95	60	37		
	28		152	.576	394	402	210	122	74	45	26		
3"	24	42#	244	.754	770	813	439	266	171	114	78	53	
	26		183	.565	585	608	323	192	120	77	49	30	
	28		152	.470	490	503	264	153	94	58	34	19	
3½"	24	48#	244	.636	920		527	320	208	140	96	66	44
	26		183	.477	700		390	232	146	94	61	38	
	28		152	.398	588		320	187	115	72	44	25	
4"	24	54#	244	.550	1,068		616	374	244	164	113	78	52
	26		183	.412	811		454	271	171	112	73	46	27
	28		152	.342	680		370	218	134	84	52	30	

T - RIB CHANELATH

Table of Safe Loads for T-Rib Chanelath Slabs When Econo Expanded Metal (Style 176-3) Is Used As Additional Reinforcing

Assumptions:

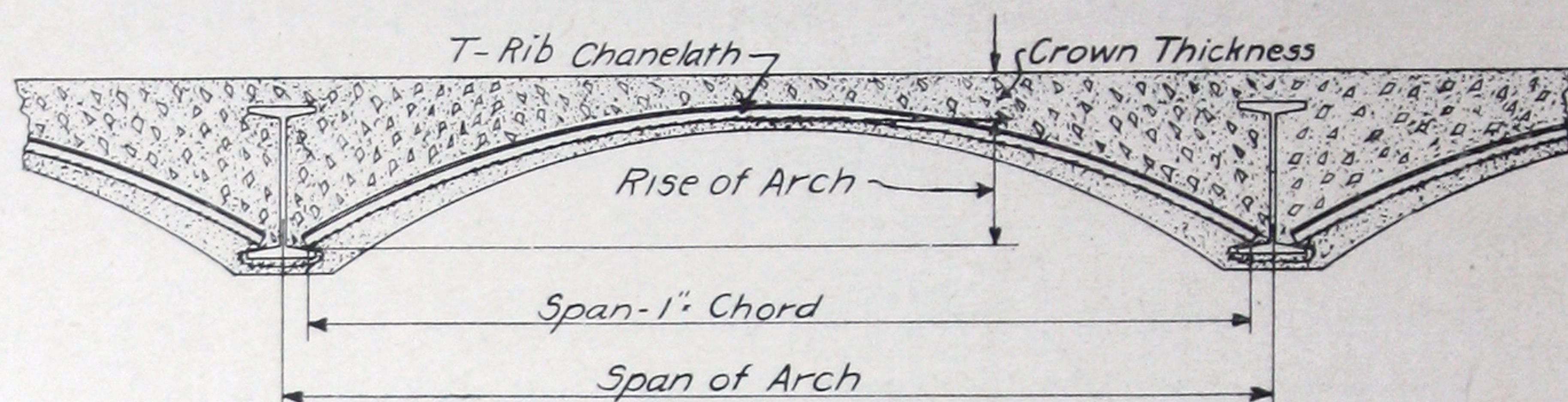
- Stress in steel not over 16,000 pounds per square inch.
- Stress in concrete not over 650 pounds per square inch.
- Ratio of moduli of elasticity equals 15.
- Center of gravity of steel is .303 inch above bottom of mesh.
- Bending moment equals $wl^2 \div 10$.

The weight of the slab as given in the third column includes the weight of the plaster coat on the bottom or underside of the slab.

Total Thickness of Slab Bottom of "Chanelath" to Top of Concrete.	Gauge of "Chanelath" and Style of Expanded metal.	Weight of Slab per Square Foot.	Distance from Top of Slab to Center of Grav- ity of Steel.	Area of Steel per Foot Width in Square Inches.	Percentage of Steel.	Moment of Resistance in Foot Pounds per Foot Width.	Safe Live Loads Lbs. per Sq. Ft.						
							Length of Span in Feet						
							6'	7'	8'	9'	10'	11'	12'
3½"	26+176-3	42#	2.87	.359	1.04	980	230	158	110	78	56	38	....
	24+176-3		2.92	.420	1.19	1,050	250	173	122	88	61	45	....
4"	26+176-3	48#	3.37	.359	.88	1,280	307	213	152	110	80	58	41
	24+176-3		3.42	.420	1.02	1,380	336	234	167	122	90	66	48
4½"	26+176-3	54#	3.87	.359	.77	1,610	394	275	198	144	107	79	58
	24+176-3		3.92	.420	.89	1,730	426	300	216	160	119	89	66
5"	26+176-3	60#	4.37	.359	.67	1,810	443	310	223	164	121	90	66
	24+176-3		4.42	.420	.78	2,100	525	370	269	200	150	114	86
5½"	26+176-3	66#	4.87	.359	.61	2,050	504	353	254	187	139	104	76
	24+176-3		4.92	.420	.71	2,400	602	424	309	230	174	132	101
6"	26+176-3	72#	5.37	.359	.55	2,260	557	388	281	207	154	115	85
	24+176-3		5.42	.420	.64	2,650	664	468	343	255	193	147	112

T - RIB CHANELATH

Table of Allowable Live Load in Pounds Per Square Foot on Arched Chanelath Floors



Span in Feet.....		6' 0"	7' 0"	8' 0"	9' 0"	10' 0"	11' 0"
Crown Thickness		3"	3"	3½"	3½"	4"	4"
Rise in Inches	6".....	255	175	152	.....	.....	.....
	8".....	321	224	195	143	.....	.....
	10".....	388	273	240	177	163	.....
	12".....	455	322	262	212	195	151
	15".....	555	396	349	263	243	190
	20".....	.....	518	458	351	323	256
	24".....	.....	.....	544	420	387	309

Note.—Tie rods must be placed between floor beams to care for the arch thrust.

Table for Determining Roof Purlins

This table is to assist the designer in the selection of roof purlins for various spans, thicknesses of slabs, and center to center of trusses. It plainly shows how much better purlin spacing can be obtained with a Chanelath roof than with corrugated steel, and that at a saving in metal.

Loads assumed:

Concrete, 12 pounds per square foot per inch of thickness.

Waterproofing, 3 pounds per square foot.

Snow and wind, 30 pounds per square foot.

Plaster, 6 pounds per square foot.

T - RIB CHANELATH

Sizes and Weights of Purlins to Carry Chanelath Roofs

C. to C. Purlins.	Thick- ness of Slab.	Center to Center of Trusses in Feet.								
		10' 0"	11' 0"	12' 0"	13' 0"	14' 0"	15' 0"	16' 0"	17' 0"	18' 0"
4' 0"	2"	5" 6 $\frac{1}{2}$ #	6" 8#	6" 8#	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #
4' 6"	2"	5" 6 $\frac{1}{2}$ #	6" 8#	6" 8#	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #
5' 0"	2"	5" 6 $\frac{1}{2}$ #	6" 8#	6" 8#	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #
5' 6"	2"	6" 8#	6" 8#	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#
6' 0"	2"	6" 8#	6" 8#	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#
6' 0"	2 $\frac{1}{2}$ "	6" 8#	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#
6' 6"	2"	.....	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#
6' 6"	2 $\frac{1}{2}$"	.....	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#
7' 0"	2"	.....	7" 9 $\frac{3}{4}$ #	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#
7' 0"	2 $\frac{1}{2}$"	.....	7" 9 $\frac{3}{4}$ #	8" 11 $\frac{1}{4}$ #	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#	12" 20 $\frac{1}{2}$ #
7' 6"	2 $\frac{1}{2}$"	.....	.....	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #
8' 0"	2 $\frac{1}{2}$"	.....	.....	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #
8' 0"	3"	.....	.....	8" 11 $\frac{1}{4}$ #	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #
8' 6"	2 $\frac{1}{2}$"	.....	.....	.....	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #
8' 6"	3"	.....	.....	.....	9" 13 $\frac{1}{4}$ #	10" 15#	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #
9' 0"	3"	.....	.....	.....	10" 15#	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #
9' 0"	3 $\frac{1}{2}$"	.....	.....	.....	10" 15#	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	10" 25#I
9' 0"	4"	.....	.....	.....	10" 15#	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	10" 25#I
9' 6"	3 $\frac{1}{2}$"	.....	.....	.....	.....	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	10" 25#I	10" 25#I
9' 6"	4"	.....	.....	.....	.....	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	10" 25#I	12" 31 $\frac{1}{2}$ #I
10' 0"	3 $\frac{1}{2}$"	.....	.....	.....	.....	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	10" 25#I	12" 31 $\frac{1}{2}$ #I
10' 0"	4"	.....	.....	.....	.....	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	12" 20 $\frac{1}{2}$ #	10" 25#I	12" 31 $\frac{1}{2}$ #I

Weights of Materials Used for Floors and Roofs

When roof or floor slabs are covered with any of the following materials the weight is considered as forming part of the live load.

Materials	Weight in lbs. per sq. ft.
-----------	----------------------------

Floors

7/8-inch, single thickness flooring, wood.....	3.00
2x4-inch spruce sleepers 16-inch ctrs. and 2-inch dry cinder concrete filling.....	8.50
Asbestone flooring 1/2-inch thick.....	3.50
Rubber tiling.....	1.00 to 3.00
Tiling	3.00 to 8.00

T - R I B C H A N E L A T H

Weights of Materials Used for Floors and Roofs—Cont.

Materials	Weight in lbs. per sq. ft.
Ceilings Hung from Roof	
3/4-inch wood ceiling	2.50
Corrugated iron	1.00
Stamped steel	2.00
Metal lath and plaster	10.00
6-inch hollow tile	23.00
8-inch hollow tile	28.00
Plastering	5.00
Roofs	
Common shingles	2.50
18-inch shingles	3.00
Slate, 3-16 inch thick	7.25
Slate, 1/4 inch thick	9.60
Plain tile or clay shingle	11.00 to 14.00
Ludowici tile	8.00
Copper sheets	1.50
Tin, including one thickness of felt	1.00
Five-ply felt and gravel	6.00
Four-ply felt and gravel	5.50
Three-ply ready roofing	1.00
Skylights with galvanized iron frame	5.00
Sheathing, 1-inch thick, pine or hemlock	3.00
Sheathing, 1-inch thick, yellow pine	4.00
2-inch book tile	12.00
3-inch book tile	20.00
2 1/2-inch solid tile	16.00

T - RIB CHANELATH

Temporary Supports

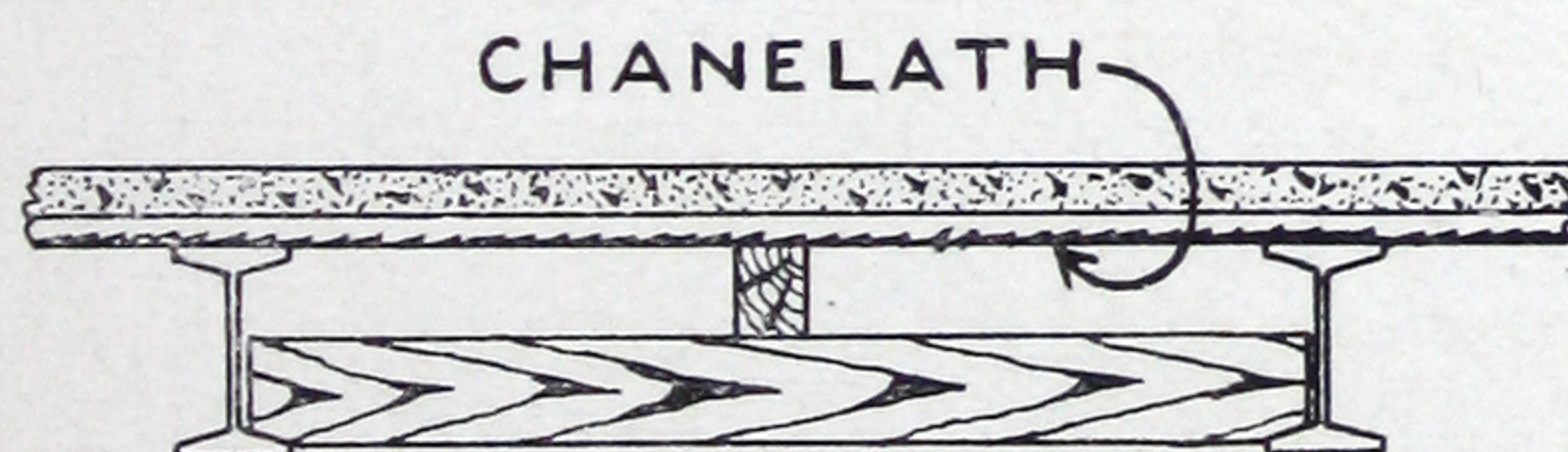
When T-Rib Chanelath is used for reinforcing concrete floors, it will have to be temporarily supported as given in the table below.

These supports may be arranged as illustrated for temporary supports for Chanelath roofs on page 28, or they may be supported from the floor below in the same manner as is customary for supporting the forms for reinforced concrete beams.

Table for Spacing of Temporary Supports

Gauge	Slab Thickness				
	1 ½ Inches	2 Inches	2 ½ Inches	3 Inches	3 ½ Inches
	Span Center to Center of Supports				
28.....	3' 9"	3' 4"	3' 0"	2' 10"	2' 6"
26.....	4' 0"	3' 6"	3' 3"	3' 0"	2' 9"
24.....	4' 6"	4' 0"	3' 8"	3' 4"	3' 0"

Wherever the spacing of the purlins necessitates long spans, it will be necessary to provide temporary supports for Chanelath roof slabs until the concrete has had time to set. Temporary supports must be placed so that no span exceeds the spacing given in the table.

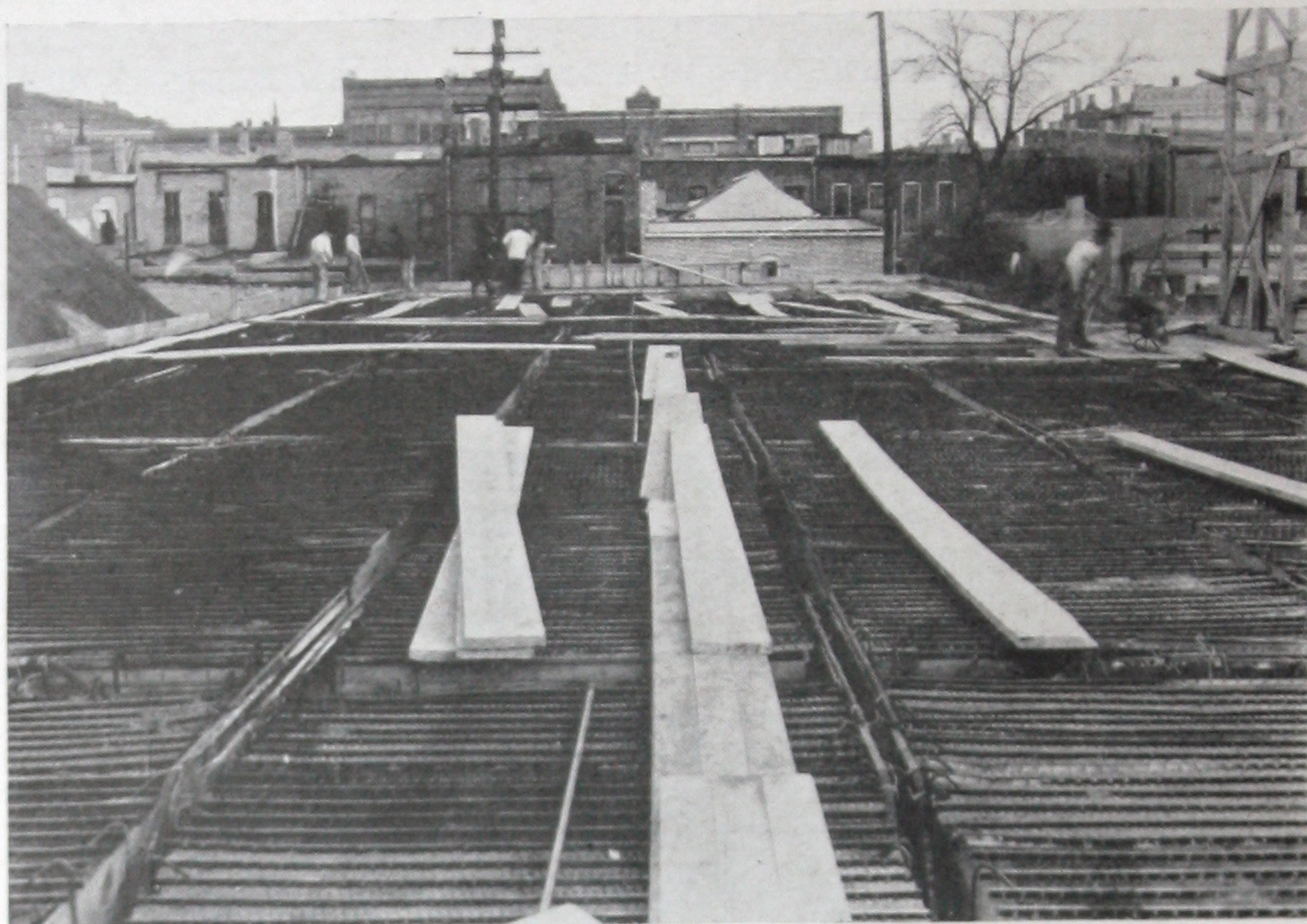


TEMPORARY SUPPORTS

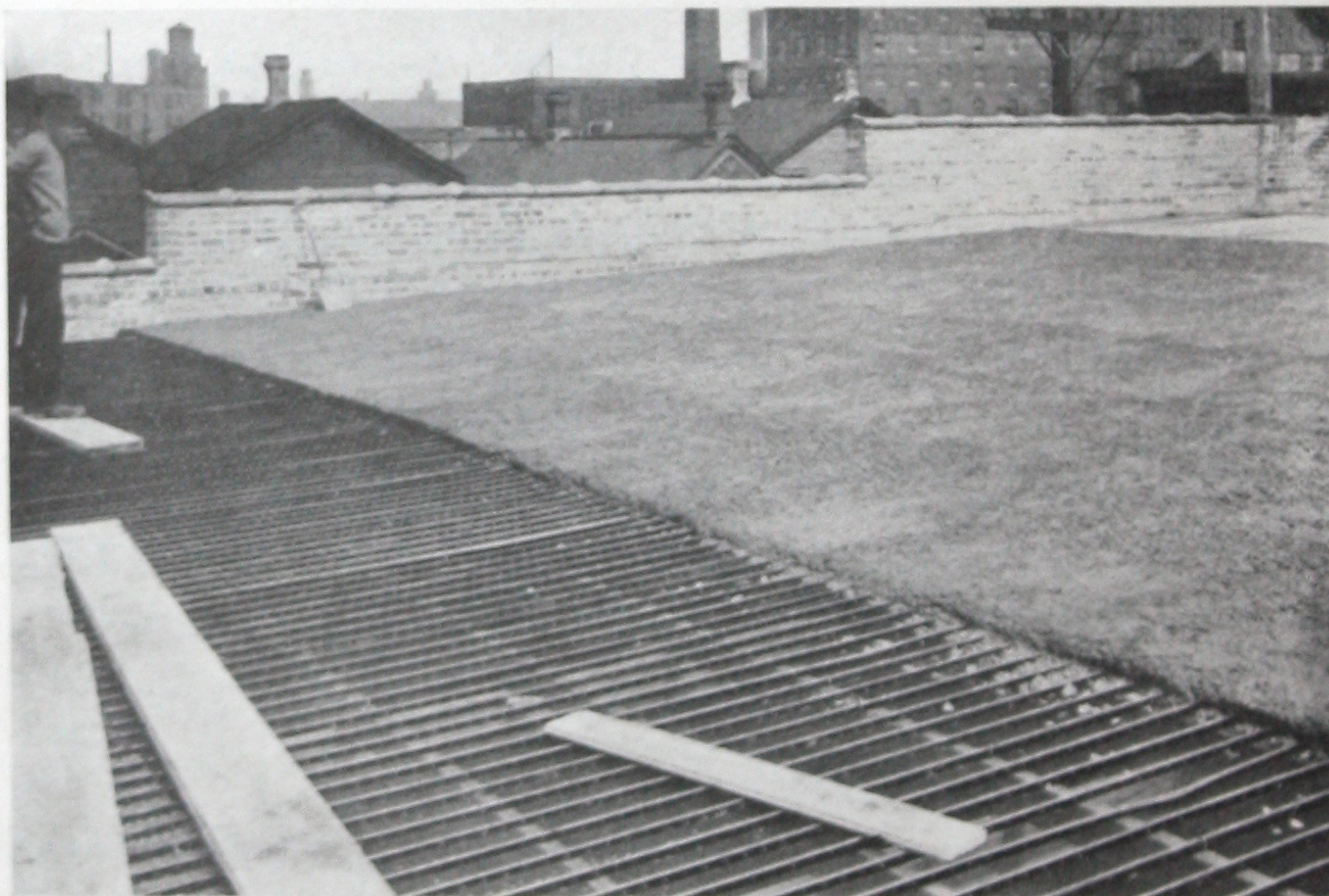
The illustration shows how the temporary supports may be applied between purlins on a flat roof.

T - RIB CHANELATH

T-Rib Chanelath Roofs



T-Rib Chanelath Garage Roof, Wichita, Kansas



Pouring Concrete on a T-Rib Chanelath Roof

T - R I B C H A N E L A T H

T-Rib Chanelath Roof Slabs

The ideal material for roof construction is reinforced concrete. It is not only fireproof, but is permanent and requires no expenditure for upkeep. The objections to concrete roofs have been the cost of the forms and the extreme weight.

T-Rib Chanelath is specially designed to overcome these objections. It provides a combined form and reinforcement that reduces the cost of erection and insures a light-weight, strong, reinforced-concrete slab suitable for any type of building and any kind of roof.

The only supports required are in the nature of temporary wooden bracing to support the Chanelath until the concrete has set sufficiently to carry its own weight. (See page 23.) This means not only a saving in cost, but a saving in time.

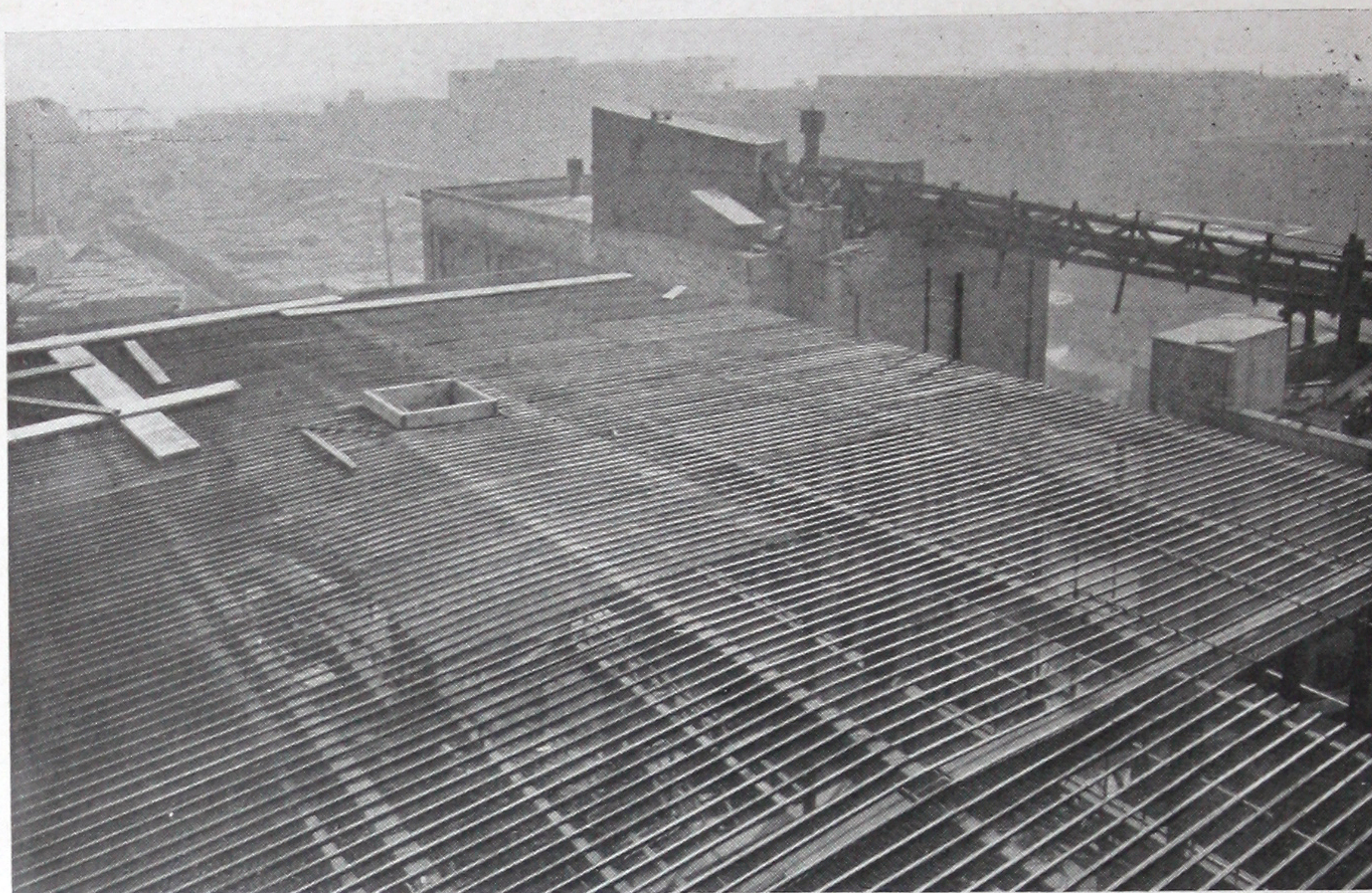
T-Rib Chanelath roofs are from 2 to 4 inches thick, depending upon the span between the purlins. The under side of the Chanelath is covered with a coat of cement plaster or other approved material averaging about $\frac{3}{4}$ inch thick; the remainder of the slab thickness consists of poured concrete above the Chanelath.

A careful study of the safe-load tables on page 18 shows that even with the thin slabs used the roof is amply strong to support all loads that will ever come upon it. The great efficiency of Chanelath as a reinforcing is largely due to the T-ribs of this material. The concrete flows around the head of the T and forms a mechanical bond that can not be excelled.

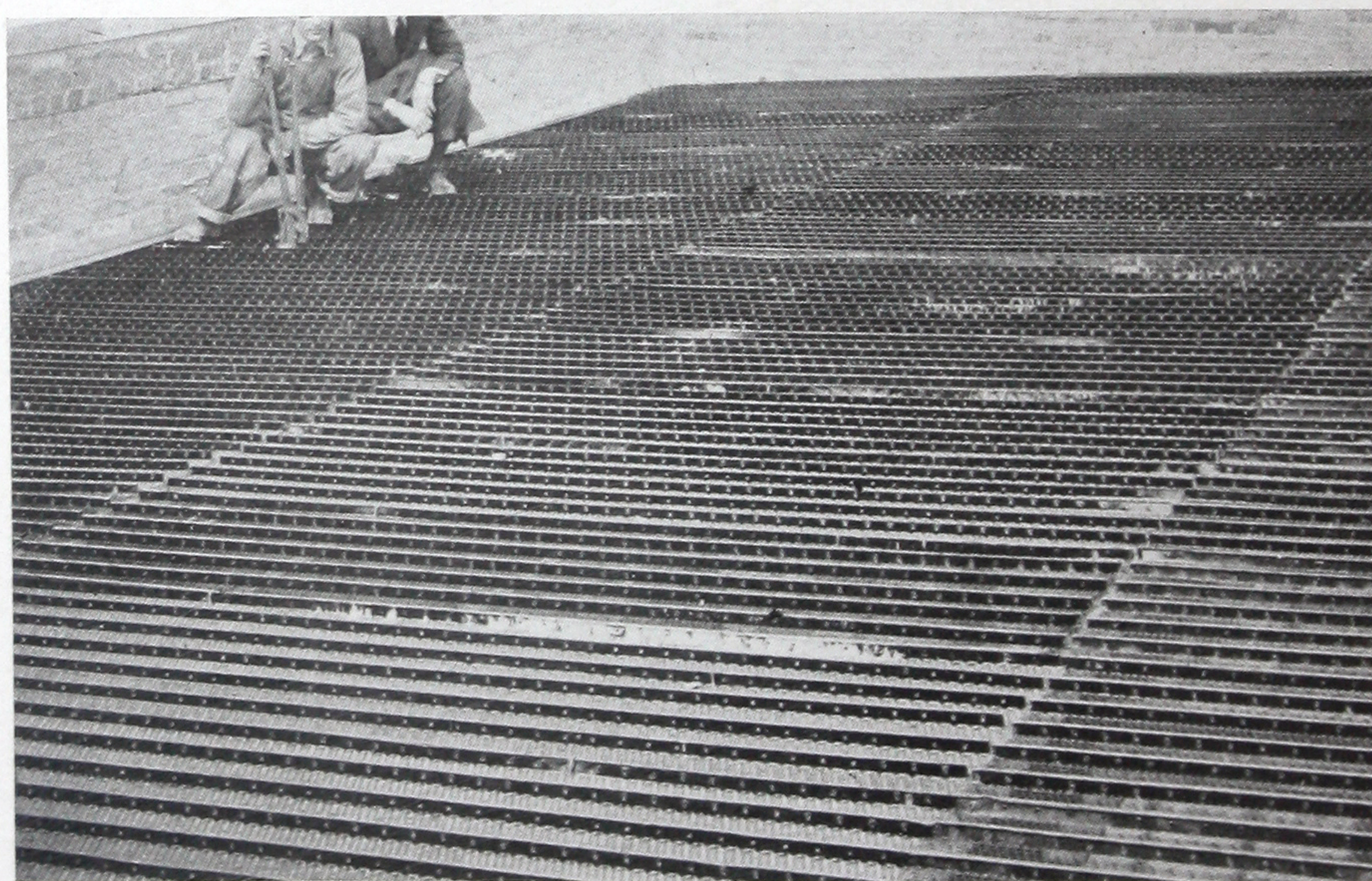
T-Rib Chanelath is a time-saver in roof construction because of the rapidity with which the large sheets can be placed on the framework of the roof. These sheets can be furnished as large as 4 feet by 12 feet. Just compare this with the time required to construct and erect a wooden form for similar work, placing and tying other forms of reinforcement, and removing the forms after the concreting has been completed.

T - RIB CHANELATH

T-Rib Chanelath Roofs



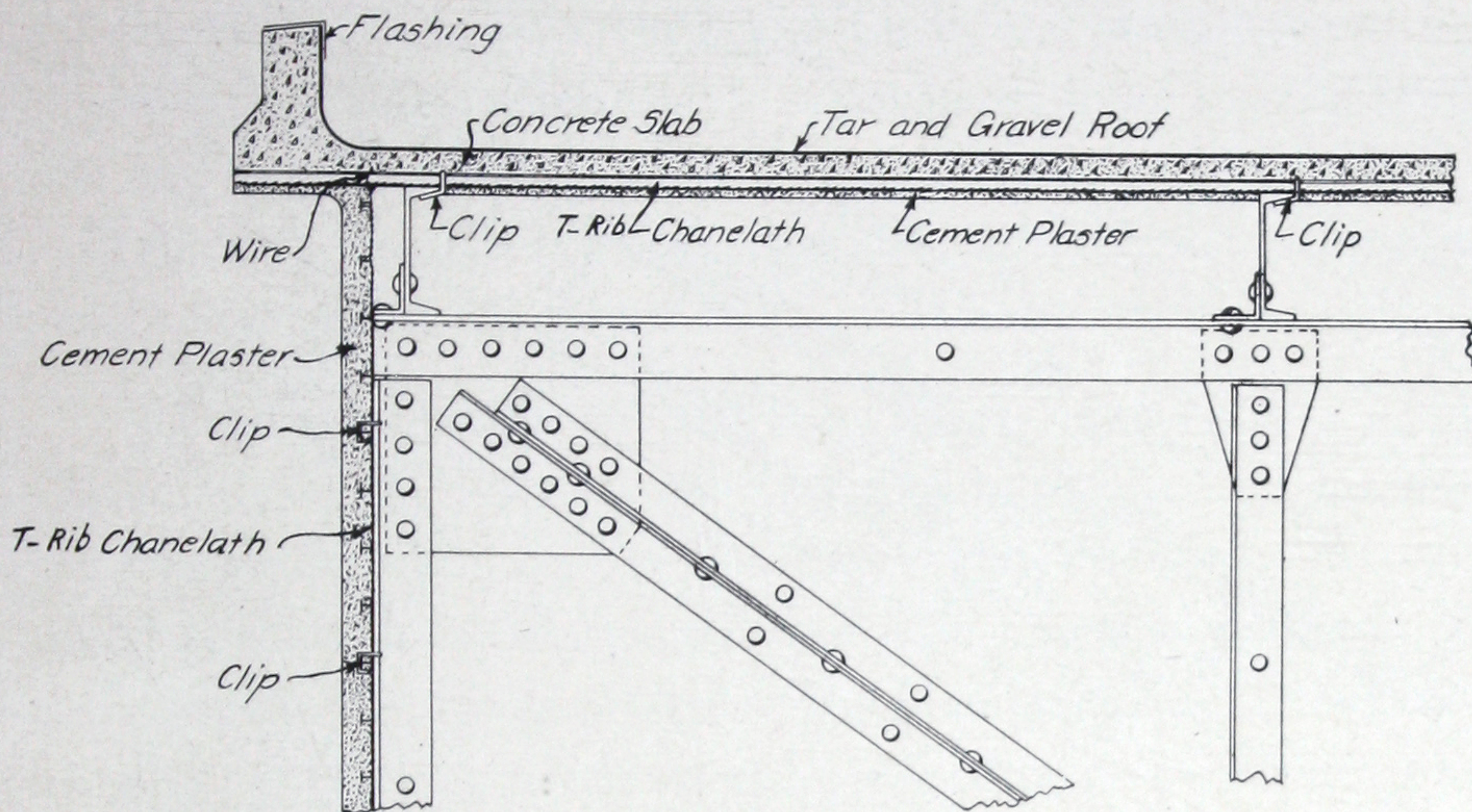
A Slightly Pitched T-Rib Chanelath Roof



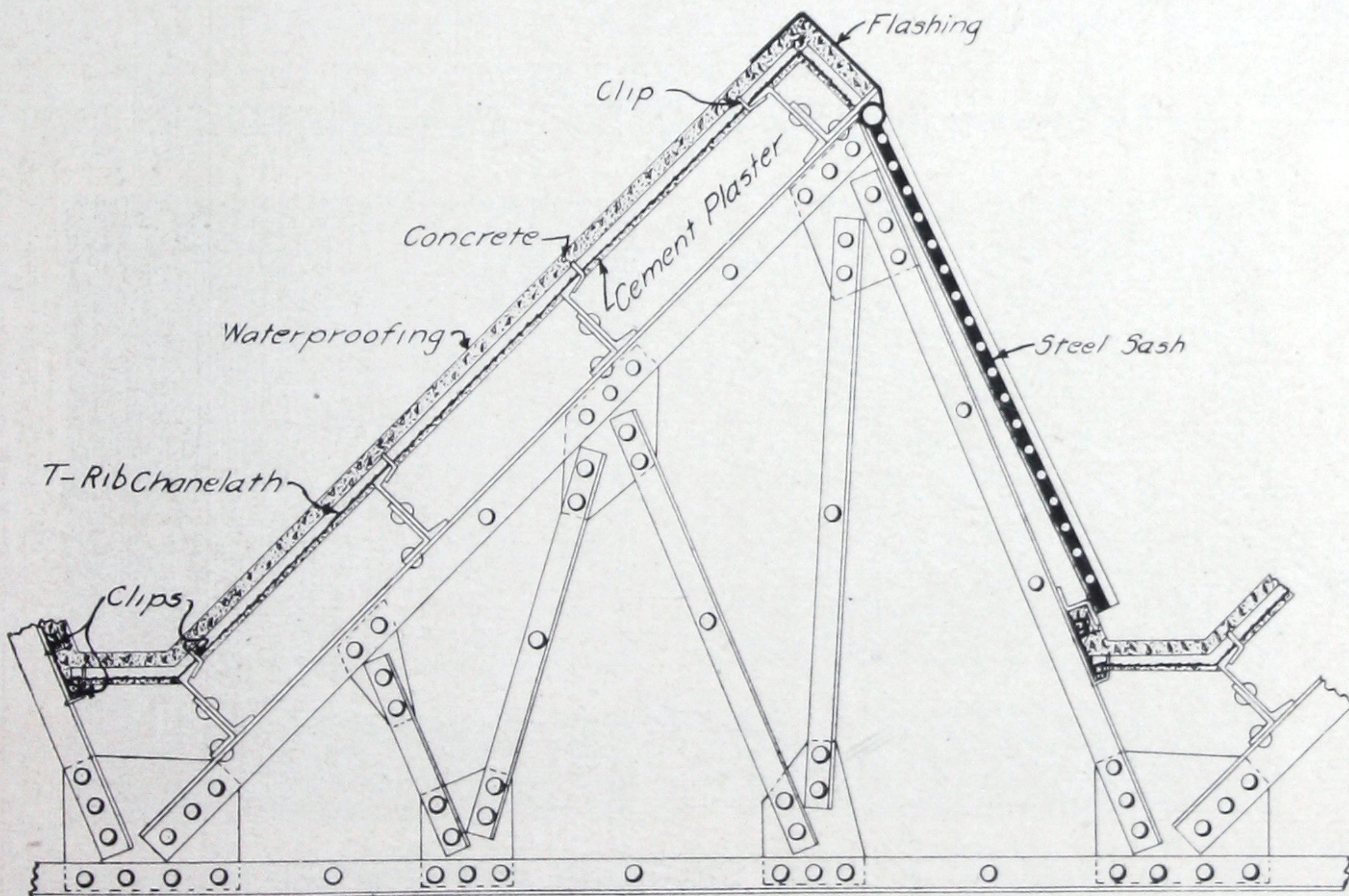
Typical Flat Roof

T - RIB CHANELATH

Construction Details of T-Rib Chanelath Roofs



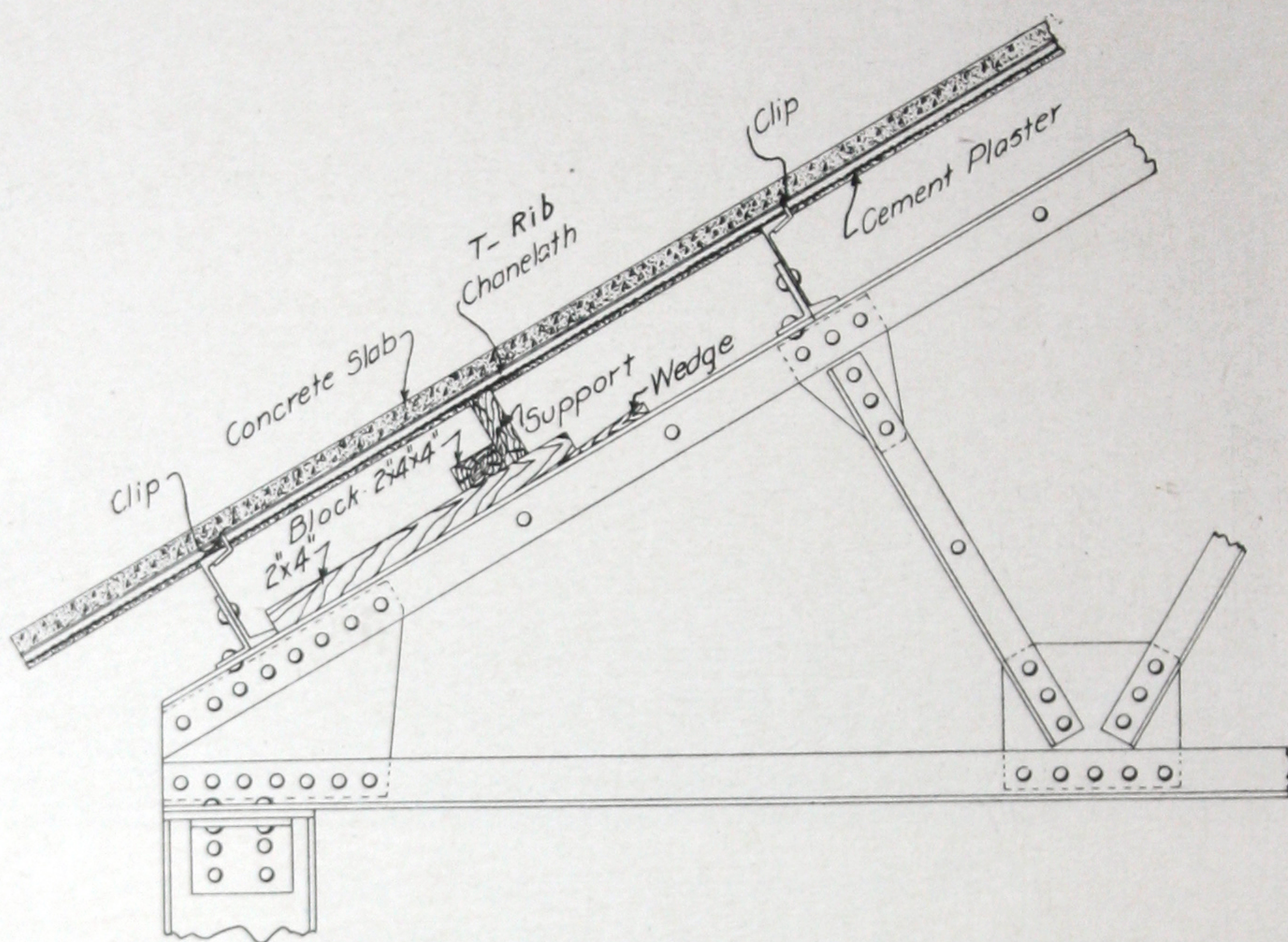
Detail of Flat T-Rib Chanelath Roof



Detail of Sawtooth T-Rib Chanelath Roof

T - RIB CHANELATH

Construction Details for T-Rib Chanelath Roofs



Temporary Supports for a Pitch Chanelath Roof



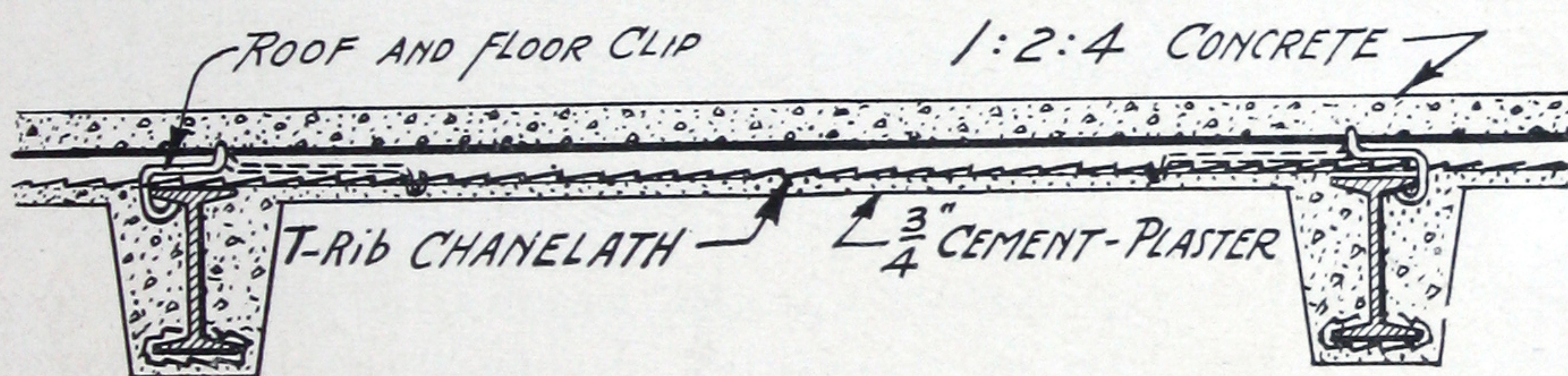
The underside of a T-Rib Chanelath slab after the concrete has been poured. Note also the temporary supports.

T-RIB CHANELATH

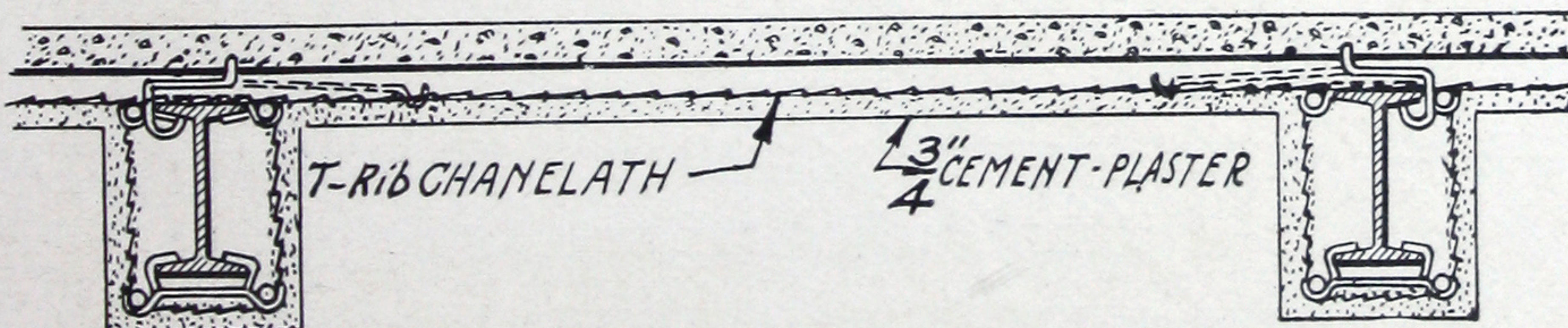
T-Rib Chanelath Floor Slabs

By using T-Rib Chanelath as a form and reinforcement for concrete floor slabs, it is possible to construct them so economically and quickly that the only valid objection to concrete floors—high cost—is entirely eliminated. No other type of fireproof permanent construction can equal the Chanelath floor.

With a steel frame, all that is necessary is to lay the T-Rib Chanelath on the I-beams and fasten it in position. The concrete is poured right on the Chanelath, and when it has set the under surface of the slab is covered with a coat of portland cement or other approved plaster. The I-beams are either encased in solid concrete or fireproofed by encasing in metal lath and plaster, as shown in the illustration of Types 1 and 2 below.



Type 1, T-Rib Chanelath Floor on Steel Beams

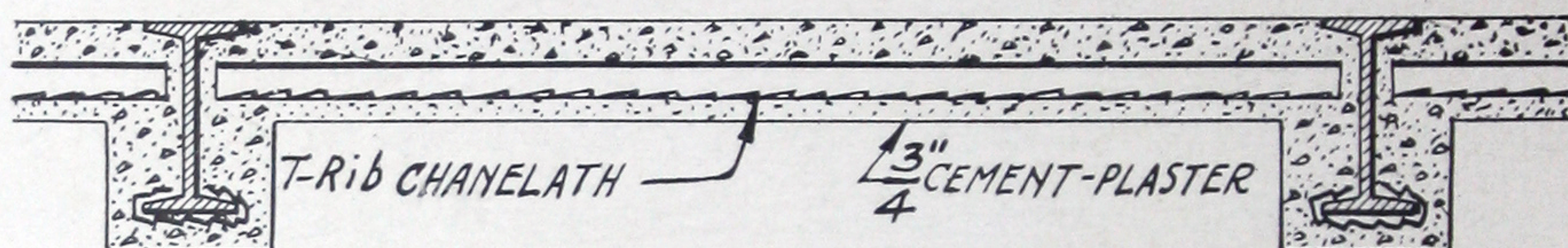


Type 2, Another Method of Constructing Concrete Floor Slabs on Steel Beams

T - RIB CHANELATH

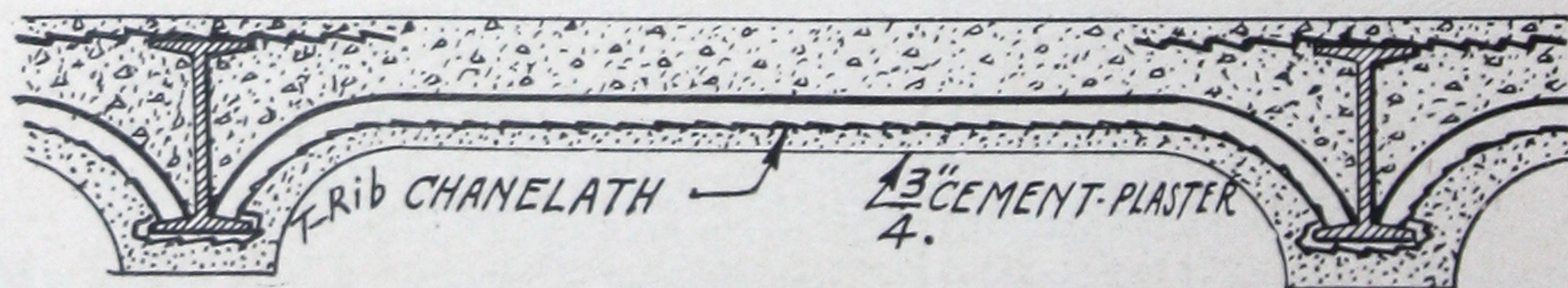
T-Rib Chanelath Floor Slabs

Another construction permits making the top of the concrete slab flush with the top of the steel floor beams, and is illustrated in Type 3. In this construction the sheets of Chanelath are cut to a length slightly less than the distance center to center of the beams, and are supported before the concrete is poured by the shallow forms for encasing the lower flanges of the I-beams.



Type 3, Another Method Used with Steel Beams

When it is desired to avoid the sharp angles at the junction of the floor slabs and obtain protection of the steel beams, Chanelath is used as shown in Type 4. The ends only of the sheets are curved, this work being accurately done at the factory. Before pouring the concrete the sheets of Chanelath are supported by the bottom flanges of the steel beams. These flanges are wrapped with Kno-Burn metal lath to form a clinching surface for the coat of plaster which is applied to the bottom of the slab and around the lower flanges of the beams.

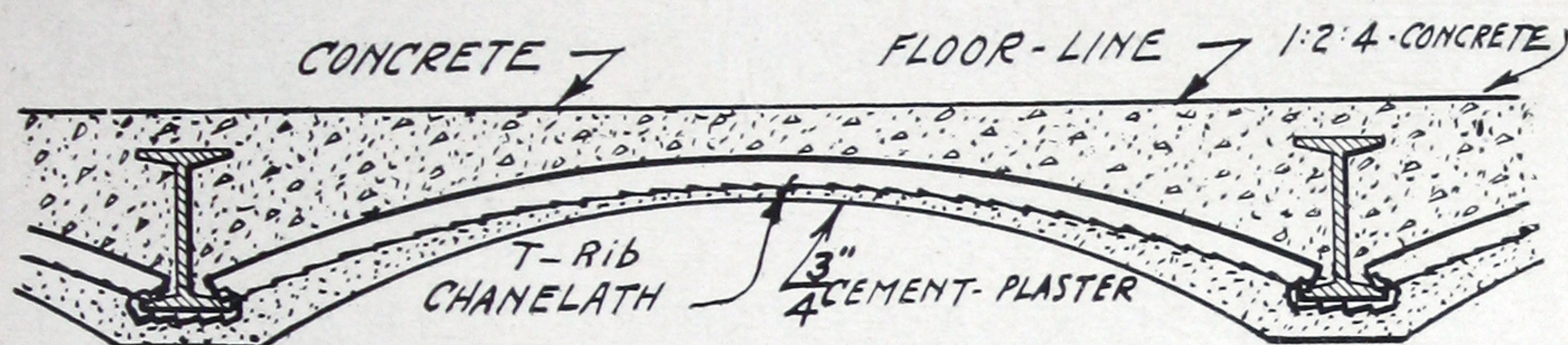


Type 4, A Method Using Curved T-Rib Chanelath

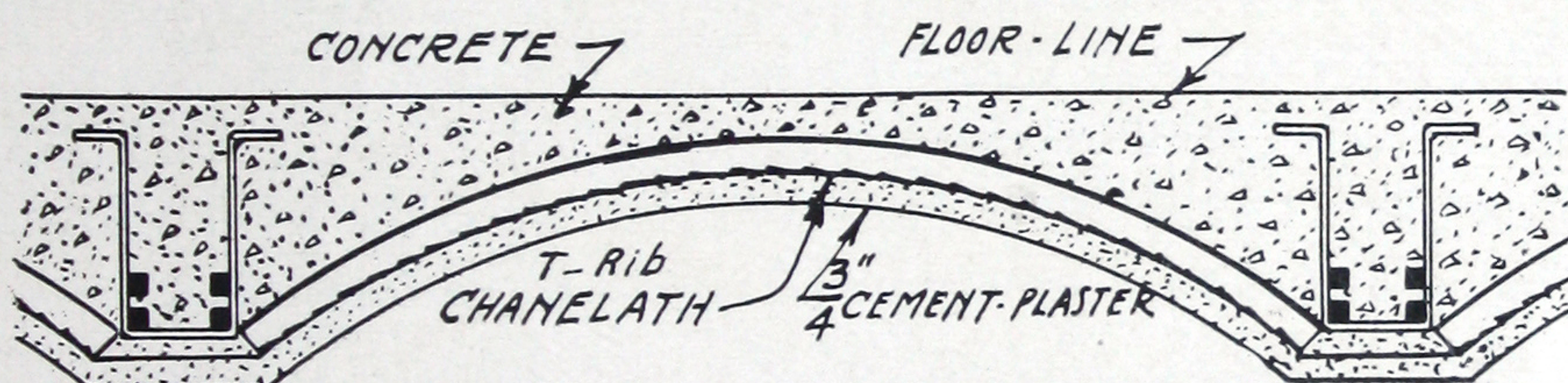
T - RIB CHANELATH

T-Rib Chanelath Floor Slabs

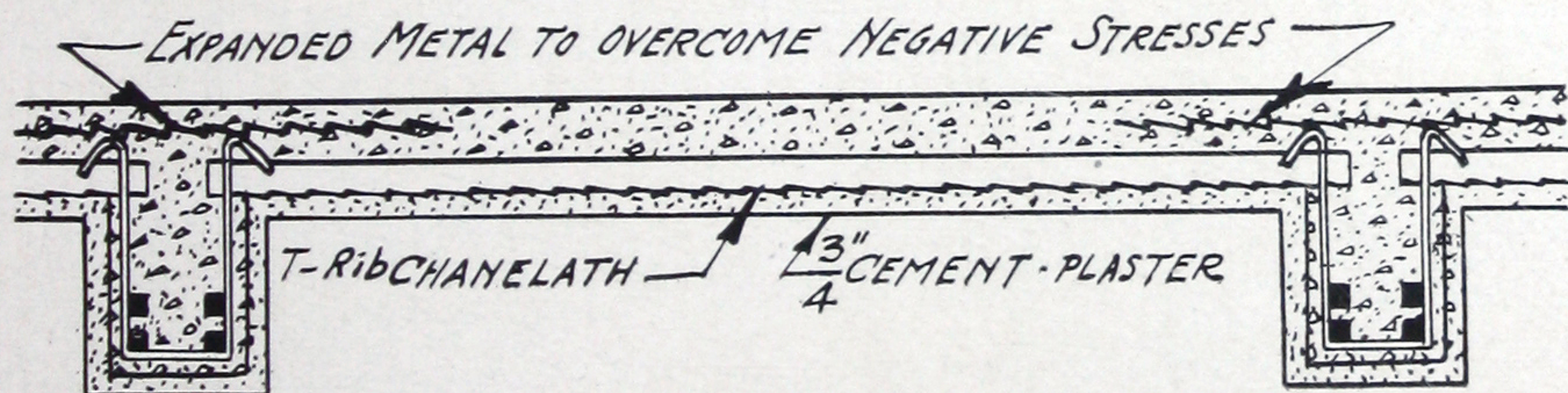
In warehouses, factories, storerooms, etc., where the loading of the floors is extremely heavy, the construction illustrated in Type 5, is usually followed. The sheets of T-Rib Chanelath are cut to length and curved to the proper radius at the factory. The ends rest on the lower flanges of the steel beams. The lower flanges of the I-beams are protected by encasing in plaster, supported by wrapping the flange with Kno-Burn expanded metal lath.



Type 5, T-Rib Chanelath Arched Floor Slab



Type 6, The Same Method Used with Concrete Beams



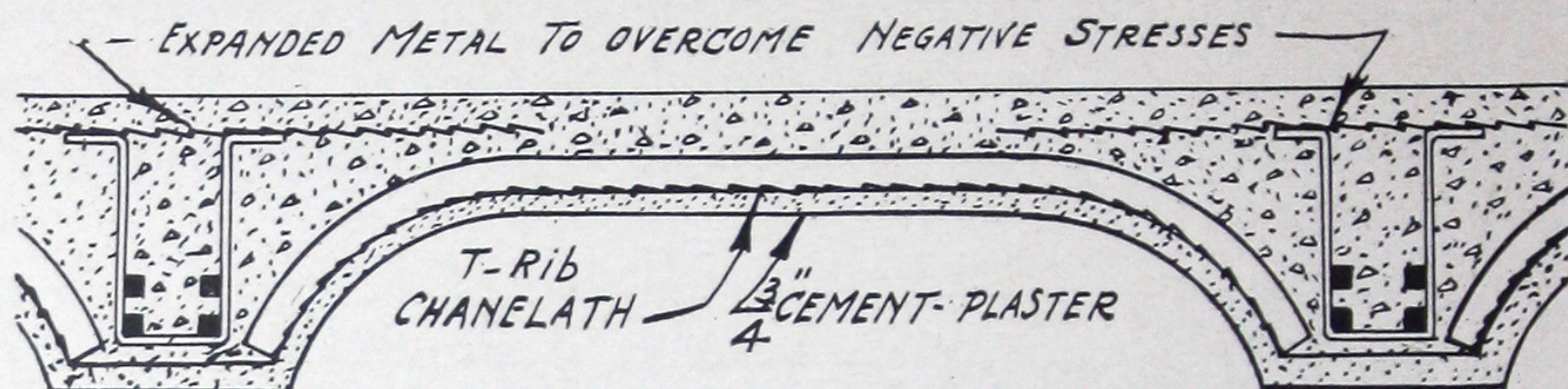
Type 7, A Flat Slab with Concrete Beams

The floor slab shown in Type 7 is merely an adaptation of Type 3, to use with concrete beams. The only forms required for this type are the beam boxes, which also support the ends of the Chanelath until the concrete is poured.

T-RIB CHANELATH

T-Rib Chanelath Floor Slabs

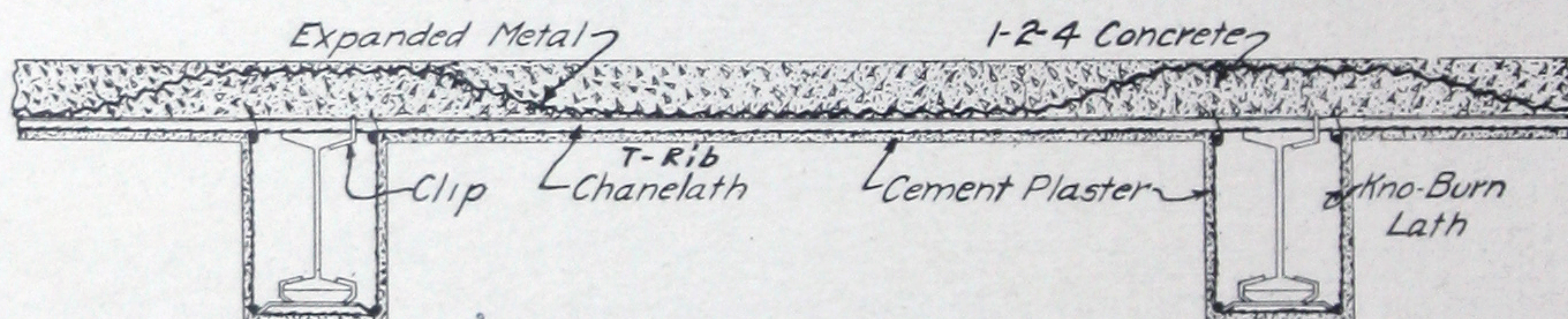
Type 8 is an adaptation of Type 4, to use on a floor where concrete structural members are used. The curved sheets of T-Rib Chanelath rest directly on the form for the bottom of the beams.



Type 8, A Chanelath Floor with Concrete Beams

Sheets of expanded metal should be used as shown in the illustrations to provide for negative bending moment.

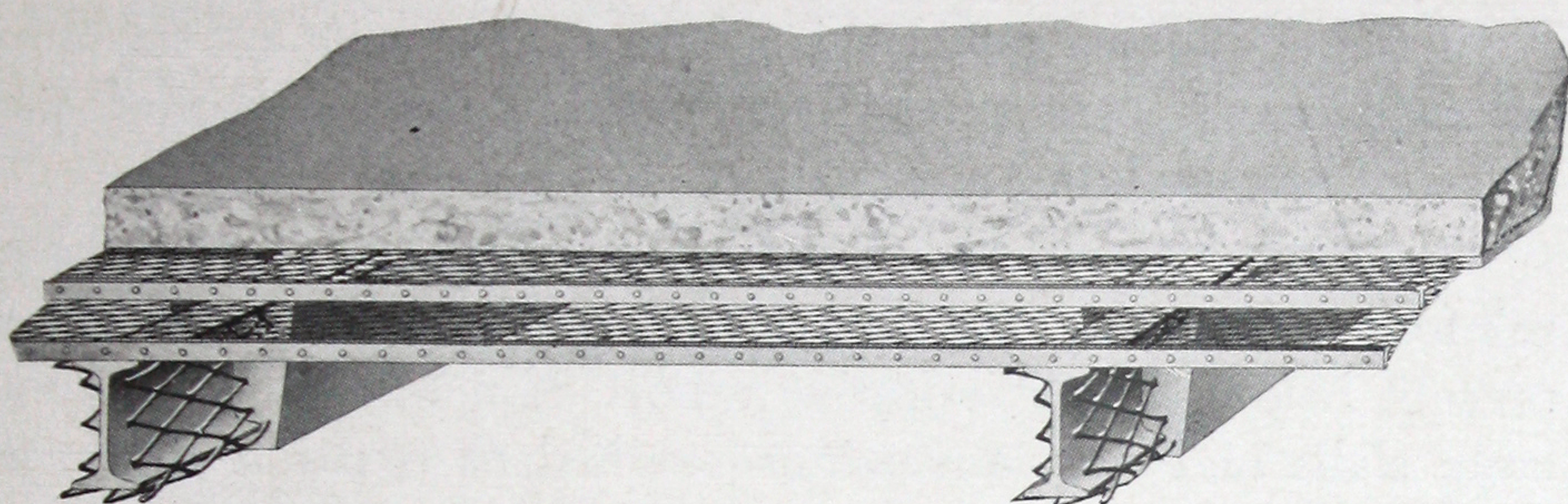
Chanelath is an ideal material to use as a form and reinforcing for the thin slabs of concrete required in the laying of tile, terrazo or composition flooring in wood-constructed buildings. The Chanelath is stapled to the top of the joists with the ribs up and the concrete poured right on the Chanelath.



T-Rib Chanelath and Expanded Metal Floors

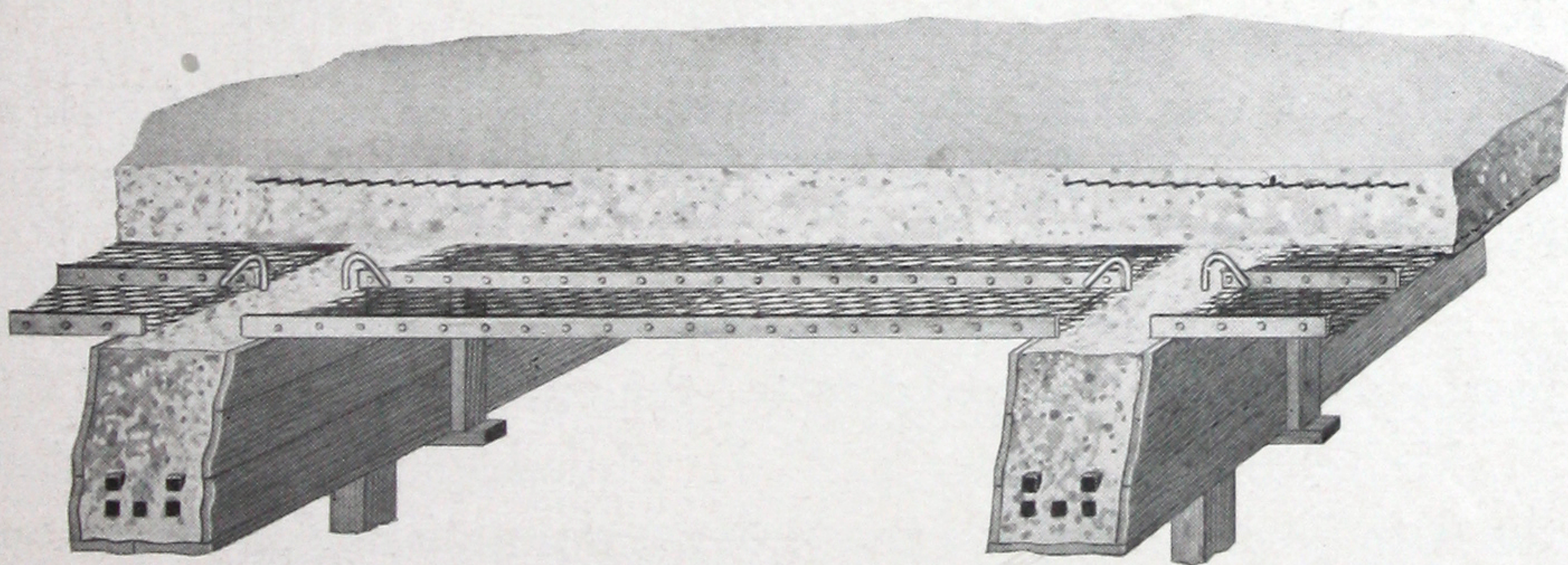
Where extremely heavy loads are to be supported on the floor and it is not convenient to use the arched type of floor, additional reinforcement of Econo expanded metal may be used as shown in the illustration. The expanded metal is our No. 176-3 Econo, but other forms of reinforcing of the same cross-sectional area may be used.

T - RIB CHANELATH



Method of constructing a flat Chanelath slab supported on steel floor beams

The table given under the designing data on page 19 contains the safe loads for slabs of various thicknesses reinforced with T-Rib Chanelath and No. 176-3 Econo expanded metal. Combinations of T-Rib Chanelath and other sizes of Econo for any live load will be furnished by our engineering department on request.



Method of constructing a flat Chanelath slab supported by concrete beams

Tests of T-Rib Chancelath Slabs

Tests conducted under the same conditions as are encountered in actual construction are conclusive evidence of the value of any building material.

To substantiate the claims made for T-Rib Chancelath as a reinforcement and form for concrete roof and floor slabs, we present below an authoritative report of a test of three concrete slabs and the conclusions reached as a result of these tests.

Purpose of the Test

To determine the total actual seepage through the mesh of Chancelath under ordinary working conditions.

To determine whether the loss of mortar on account of seepage should be taken into consideration when computing the strength of the concrete slab.

To determine the allowable strength of concrete slabs reinforced with Chancelath, using various types of aggregate.

To determine whether the bond of painted Chancelath to the concrete was sufficient to develop the strength of the steel.

Test Data

The test was conducted under the supervision and direction of the Bureau of Building Inspection of the City of Philadelphia, Pa., Mr. Edwin Clark, Chief.

Mr. George Warner of the Bureau of Building Inspection, personally supervised and directed the entire test.

Mr. Otto H. Gentner, Jr., C. E., Philadelphia, Pa., compiled the data given herein and made the computations for the entire test.

The Henry S. Spackman Engineering Company Laboratory made the quantity analysis of the seepage.

T - RIB CHANNELATH

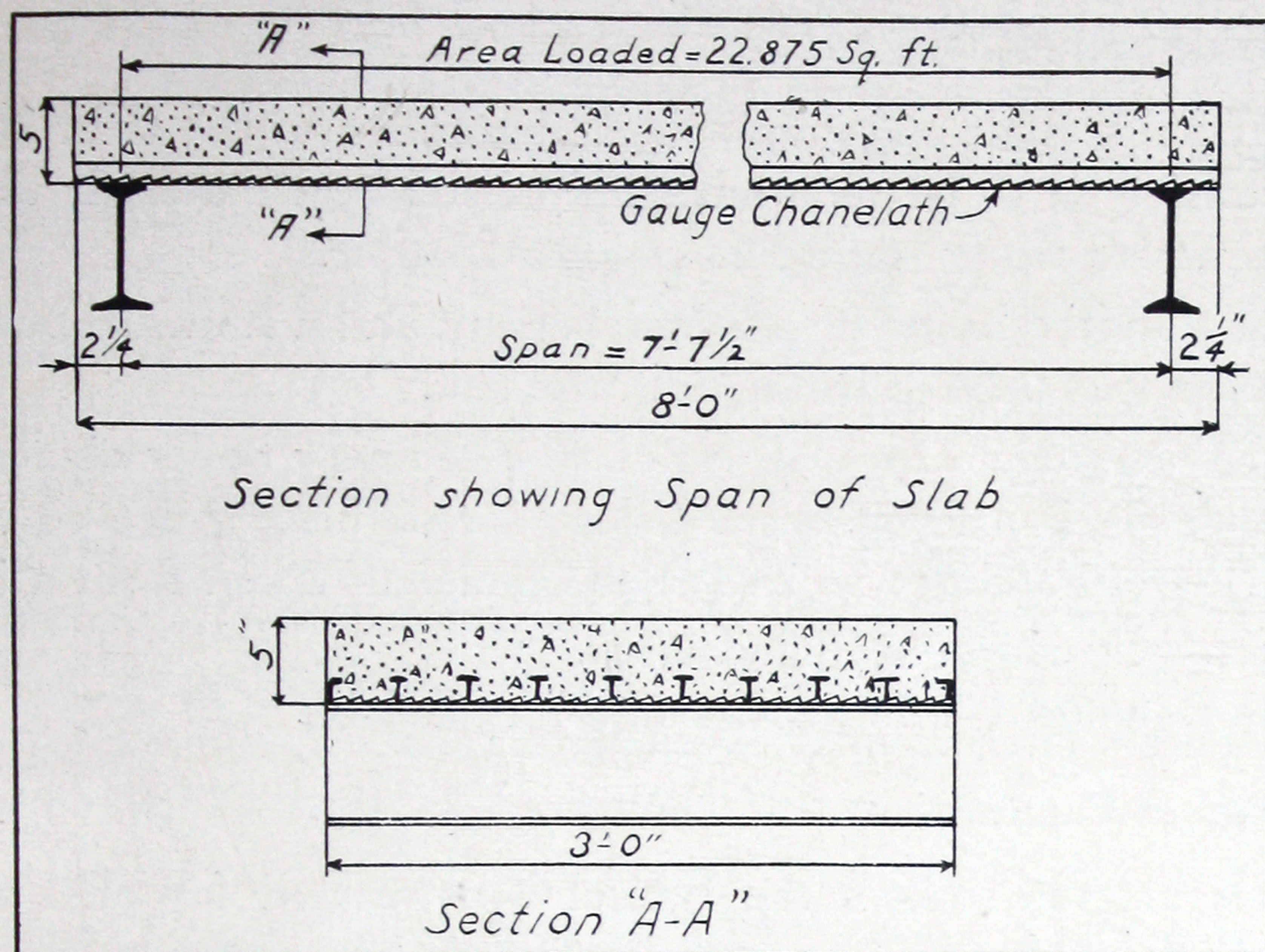


Diagram Showing Method of Constructing Slabs

The concrete was mixed and placed by The Drehmann Paving Co. and the lathing done by Mr. C. C. Boulden.

The slab tests were conducted at 31st and Jefferson Streets, Philadelphia.

The seepage test was made when the slabs were constructed on May 29th, 1916.

The slabs were tested for deflection according to the Building Code of the City of Philadelphia, July 17th, 1916, and tested to destruction July 19th, 1916.

The weather reports on May 29th, 1916, given by the U. S. Government Weather Bureau in Philadelphia were as follows:

Temperature of air—70 to 83 degrees.

Wind—Average 7.8 miles per hour, southwest.

Weather—Cloudy, 59% sunshine.

Date—May 29th, 1916.

T - R I B C H A N E L A T H

Materials and Mixture

The materials going into the construction of the slabs may be considered to be representative of the best materials used for concrete work in the Philadelphia District.

A standard brand of portland cement and a standard building sand was utilized throughout the test.

The aggregate for slab No. 1 was ordinary boiler cinders; for slab No. 2 crushed furnace slag; for slab No. 3 pea gravel.

The reinforcing was 24 gauge Chancelath taken from a job under construction in Philadelphia.

A standard 1-2-4 mix was used for all slabs.

Method of Construction

The diagram shows the typical construction for all three slabs. Steel I-beams, spaced 7 feet 7½ inches center to center, were placed upon a solid foundation in a building being constructed at 31st and Jefferson Streets, Philadelphia. Temporary supports were then placed 18 inches center to center to support the Chancelath until the concrete had hardened. A specially constructed galvanized iron tank, which exactly fitted the space between the I-beams was then placed under the slabs so that it would catch all the moisture or seepage. Chancelath was then placed in position as shown on the sketch, and a wooden form placed around the sheet to prevent the concrete from overflowing.

The slabs being ready for pouring, the concrete was mixed by hand on a wooden platform, from which there was practically no loss of moisture. The concrete was mixed in the following manner, under the personal direction of Mr. George Warner, of the Building Department of the City of Philadelphia, who dictated the amount of water he thought necessary to make good concrete, based on his large experience in this class of construction.

T - RIB CHANELATH

First, the sand was placed upon the platform and spread.

Cement was placed upon the sand and spread.

The sand and cement was turned three times dry and once wet.

The mixture was then spread and the aggregate added and wet.

The mortar and aggregate were then turned once and more water added, after which it was turned again.

The resultant mix was what is technically known as "Quakey," water rising easily to the surface when it was struck, or patted, with a shovel. It was deposited on the Chanelath with a No. 2 shovel, and tamped after placing with an iron tamper in the hands of an ordinary laborer.

In mixing the concrete actual count was kept of all the cement, sand, aggregate and water going onto the mixing board, all measurements being made with an ordinary galvanized bucket. The material left on the board and not required for the slab was carefully measured, and the different constituents pro rated according to their relative proportion in the mix. In this manner an accurate count was kept of all the materials going onto the Chanelath.

Seepage Test

The concrete that had dripped through the mesh into the pan was then carefully measured and placed in glass jars. These jars were then turned over to the Henry S. Spackman Engineering Company for analysis, and a copy of their letter showing the various constituents of the seepage is given on the next page.

The table on the next page gives in detail the result of the seepage test. All computations on this table were made by Mr. Otto H. Gentner, Jr., Consulting Engineer of Philadelphia, Pa.

T - R I B C H A N E L A T H

Seepage Tests of Concrete Slabs on Chancelath Centering							
Test Number	Material	Actual Material used in Cu. ft.	Lost by Seepage thru Mesh of Lath in Cubic ft.	Actual Cubic feet of Material in final Slab	% of Seepage in terms of respective Materials	Percentage of Water used in terms of Cement and Sand used	Percentage of Water Retained in terms of Cement and Sand Retained
#1 Cinder Concrete	Cement	2.7667	.0545	2.7122	1.97		
	Sand	5.5333	.1747	5.3586	3.15		
	Cinders	11.0667	.0042	11.0625	0.04		
	Total	19.3667	.2334	19.1333	1.20		
	Water	2.9167	.4667	2.4501	16.00	35.10	30.35
	Grand Total	22.2834	.7000	21.5834	3.14		
#2 Slag Concrete	Cement	2.750	.1050	2.645	3.82		
	Sand	5.500	.2345	5.2655	4.26		
	Slag	11.000	.0105	10.9895	0.09		
	Total	19.250	.3500	18.9000	1.82		
	Water	2.625	.1167	2.5083	4.43	31.80	31.70
	Grand Total	21.875	.4667	21.4083	2.13		
#3 Pebble Concrete	Cement	2.7667	.0615	2.7052	2.22		
	Sand	5.5333	.1560	5.3773	2.82		
	Pebbles	11.0667	.0159	11.0508	0.14		
	Total	19.3667	.2334	19.1333	1.20		
	Water	1.9833	.0875	1.8958	4.41	23.90	23.40
	Grand Total	21.3500	.3209	21.0291	1.50		

Mr. Otto H. Gentner, Jr.,
North American Building,
Philadelphia, Pa.

Dear Sir:-

Upon analysis we find samples of mortar marked as below, submitted by you May 31st, 1916, to contain:-

Laboratory No.....	4401	4402	4403
Mark	#1	#2	#3
Portland Cement.....	23.37%	30.01%	26.35%
Sand	74.83"	66.99"	66.85"
Aggregate (Coarser than ¼" size)	1.80"	3.00"	6.80"

Respectfully submitted,

HENRY S. SPACKMAN ENGINEERING CO.

E. L. CONWELL,

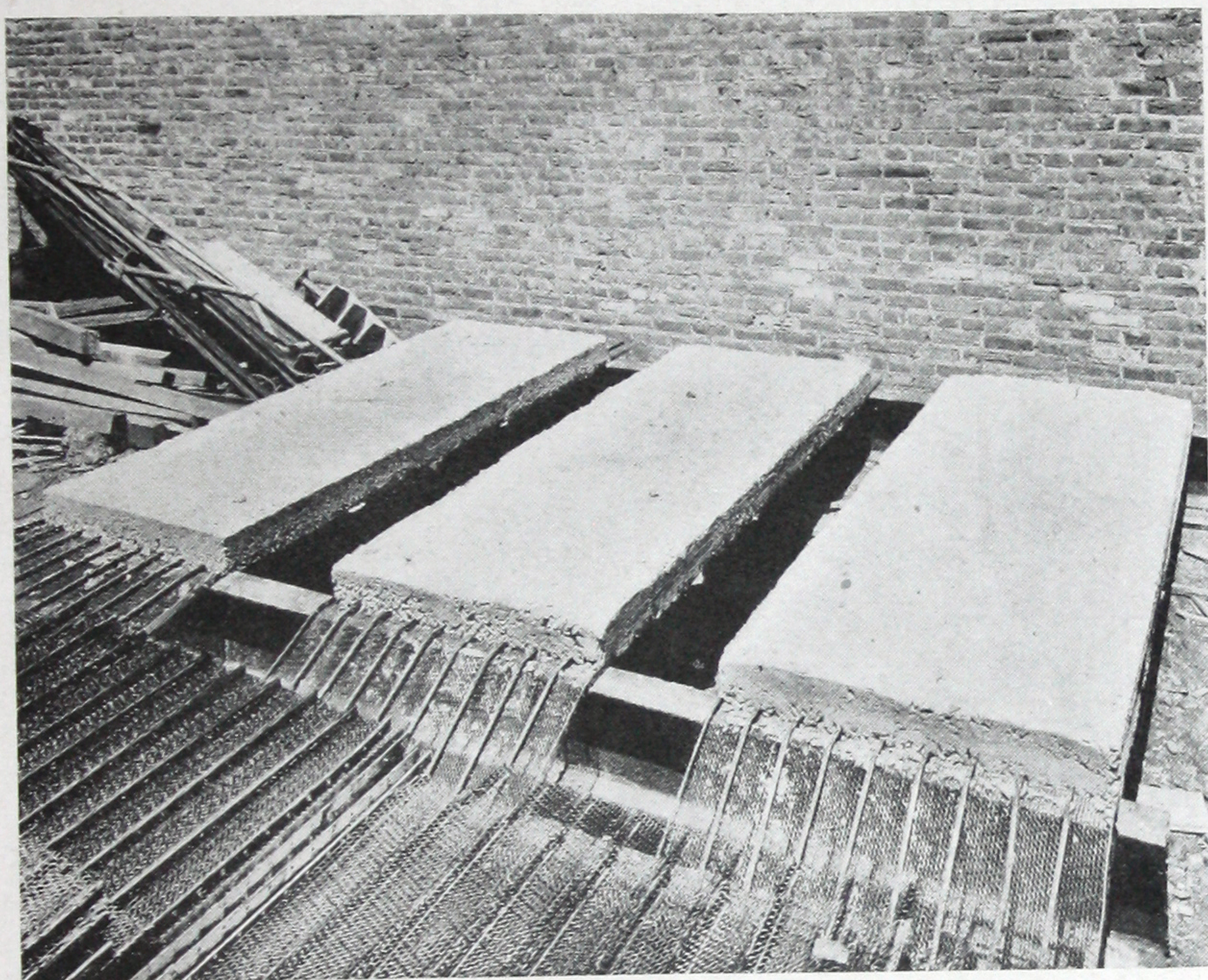
Vice-President

MB

T - RIB CHANELATH

Strength Test

The strength test of the concrete slabs, reinforced with Chanelath was conducted at the same location and under the same supervision as the seepage test. Every care known to the engineering profession was taken to insure absolute accuracy in the results obtained.



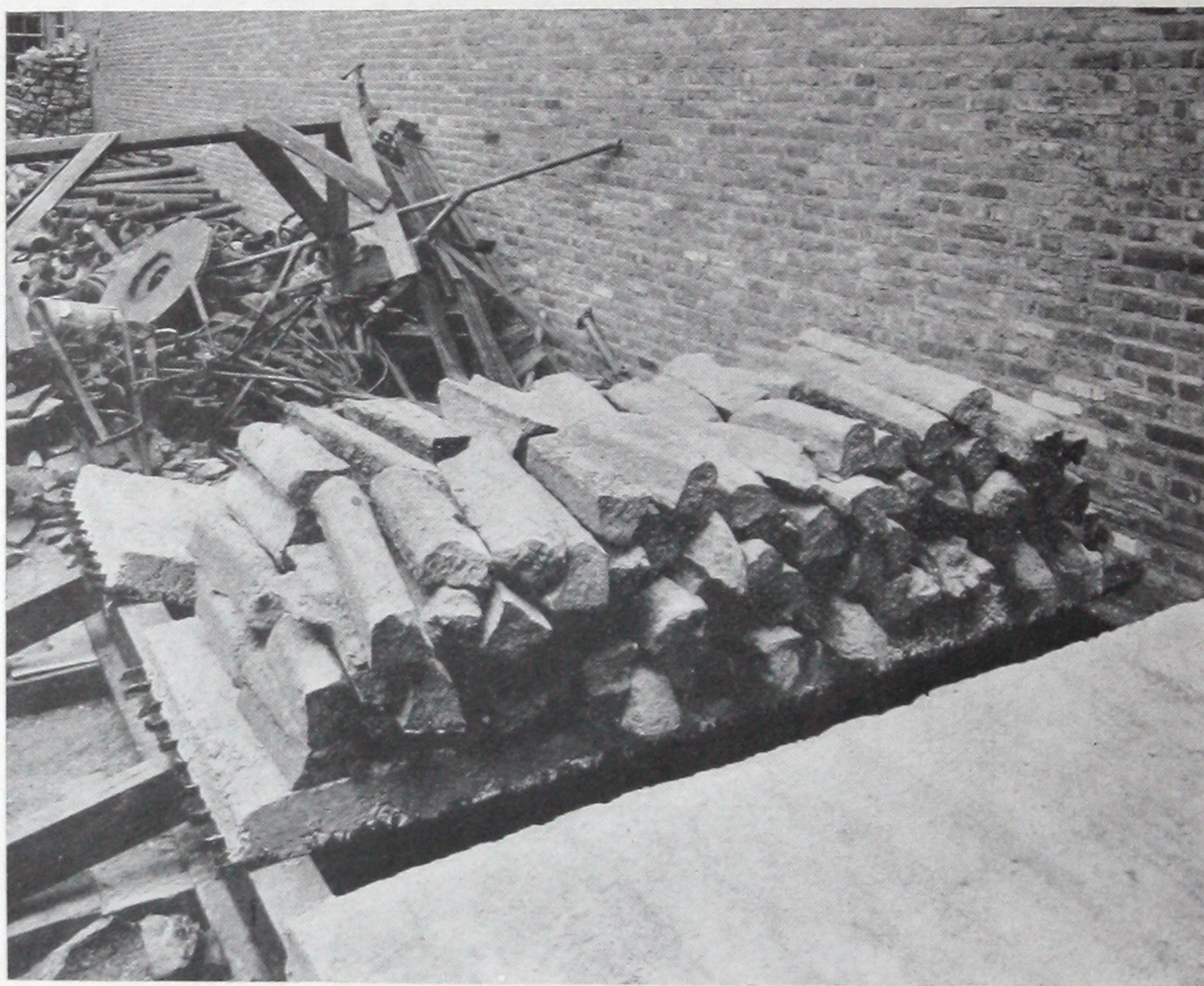
The Finished Slabs Ready for Strength and Deflection Tests

Manner of Conducting the Test

The slabs were tested on July 17th for deflection by applying a uniform load, equal to the dead load of the slab (or weight of the slab) plus twice the load which was computed as the safe live load, using a unit stress in concrete of 650 lbs. per square inch, and in steel, of 16,000 lbs. per square inch (City of Philadelphia standard recommendation for unit stresses). The deflection was measured as the load was applied and im-

T - RIB CHANELATH

mediately after the application while it was still bearing the full test load. The full load was allowed to remain on the slab for 48 hours, and the deflection at the end of that time measured. The load was then removed and the deflection measured immediately after its removal. The deflection test being completed, the slabs were tested to destruction on July 19th by loading them uniformly until they ruptured.



Method of Loading Slabs

Conditions of Testing

Load.—The load consisted of pigs or billets of iron obtained from a nearby foundry.

Weighing.—A standard Fairbanks and Morse scale was used in weighing each individual billet before it was placed upon the slab. The scale was previously tested for accuracy.

T - R I B C H A N E L A T H

Placing Load.—Each billet was carefully placed in position upon the slab in such a manner as to practically alleviate all impact.

Measuring.—The deflection was measured with an engineer's scale of known accuracy from a standard which was detached from the slab and, which remained at a constant height during the entire test. Several measurements were made at each reading by different parties to prevent all possibility of error.

Computations.—The data obtained in conducting the test was compiled and all computations made by Mr. Otto H. Gentner, Jr., Consulting Engineer, Philadelphia, Pa.

Report of the Strength and Deflection Test

Testing for Deflection with Twice the Calculated Live Load Plus Once the Dead Load												
Test Number	Age in Days	Material	Area in Sq. in.	Percentage of Steel in Concrete	Calculated Resist Moment in inch lbs. - Phila Law - allowable stresses steel limiting factor	Safe figured Live Load in lbs. per sq. ft.	Test Load in lbs. per sq. ft.	Deflection at ctr under Load stated below	Deflection at ctr under Total Test Load	Center Defl. 48 hours after total Test Load was applied	Ctr. Defl. after Test Load was Removed	Amount of Defl. Recovered
#1 Cinder Concrete		Steel	1275	00239	9368" #	67.4	183 #	88.5 #/o 1/32"	5/32"	7/32"	4/32"	3/32"
	49	Cinder Concrete	53.4		11528" #						Read at once	
#2 Slag Concrete		Steel	1275	00239	9646" #	55.6	173.1 #	88.7 #/o 1/32"	3/32"	7/32"	5/32"	2/32"
	49	Slag Concrete	53.4		19207" #						Read 15 min. after removing Load	
#3 Pebble Concrete		Steel	1275	00239	9646" #	48.1	166.6 #	87.9 #/o	3/32"	5/32"	1/32"	4/32"
	49	Pebble Concrete	53.4		19207" #			None			Read 30 min. after removing load	

The above table gives the complete results of the deflection test. The results of the test of the slabs when broken are given in the table on the next page.

Conclusions of the Test

The test conclusively proves that the difference between the amount of seepage through the mesh of Chanelath, as compared with the normal seepage through wood forms is negligible.

That the seepage was of such a slight percentage that its loss had no appreciable effect on the strength of the concrete and, therefore, could be eliminated from consideration in

T - R I B C H A N E L A T H

Loading Tests to Destruction				
Test Number	Figured U _L Load per sq. ft. Phila. Law	Test Load per sq. ft. at failure	Deflection at Center under load stated below	Remarks as to how slab failed
# 1 Cinder Concrete	407 [#]	463.1 [#]	356 [#] / _{17/32"}	Failed at Center steel broke in tension
# 2 Slag Concrete	406.4 [#]	570.3 [#]	430 [#] / _{22/32"}	Failed at Center steel broke in tension
# 3 Pebble Concrete	398.6 [#]	570.3 [#]	435 [#] / _{16/32"}	Failed at Center steel broke in tension

designing this class of construction.

That as all three slabs failed in tension at exceedingly high unit stresses in steel — proves that painted Chancelath develops a bond with the concrete that is sufficient to develop the full strength of the steel. (See illustration on page 42.)

The small amount of deflection and the rapid recovery of the slab after deflection proves the satisfactory performance of Chancelath as a reinforcing material.

The exceeding high unit stresses in the steel at the time of rupture—the minimum being almost 50% more than the usual ultimate strength of medium steel reinforcing rods—proves Chancelath to be the equal, as material, to the best quality of high carbon steel rods.

The ultimate result of the completed test was that Chancelath was declared satisfactory as reinforcement for concrete slabs.

The following people were witnesses to the test:

Mr. Otto C. Wolf, Architect and Engineer, Philadelphia, Pa.

Mr. A. Raymond Raff, Builder, Philadelphia, Pa.

Mr. Otto H. Gentner, Jr., Con. Engr., Philadelphia, Pa.

Mr. Geo. Warner, Bureau of Building Inspection, Philadelphia, Pa.

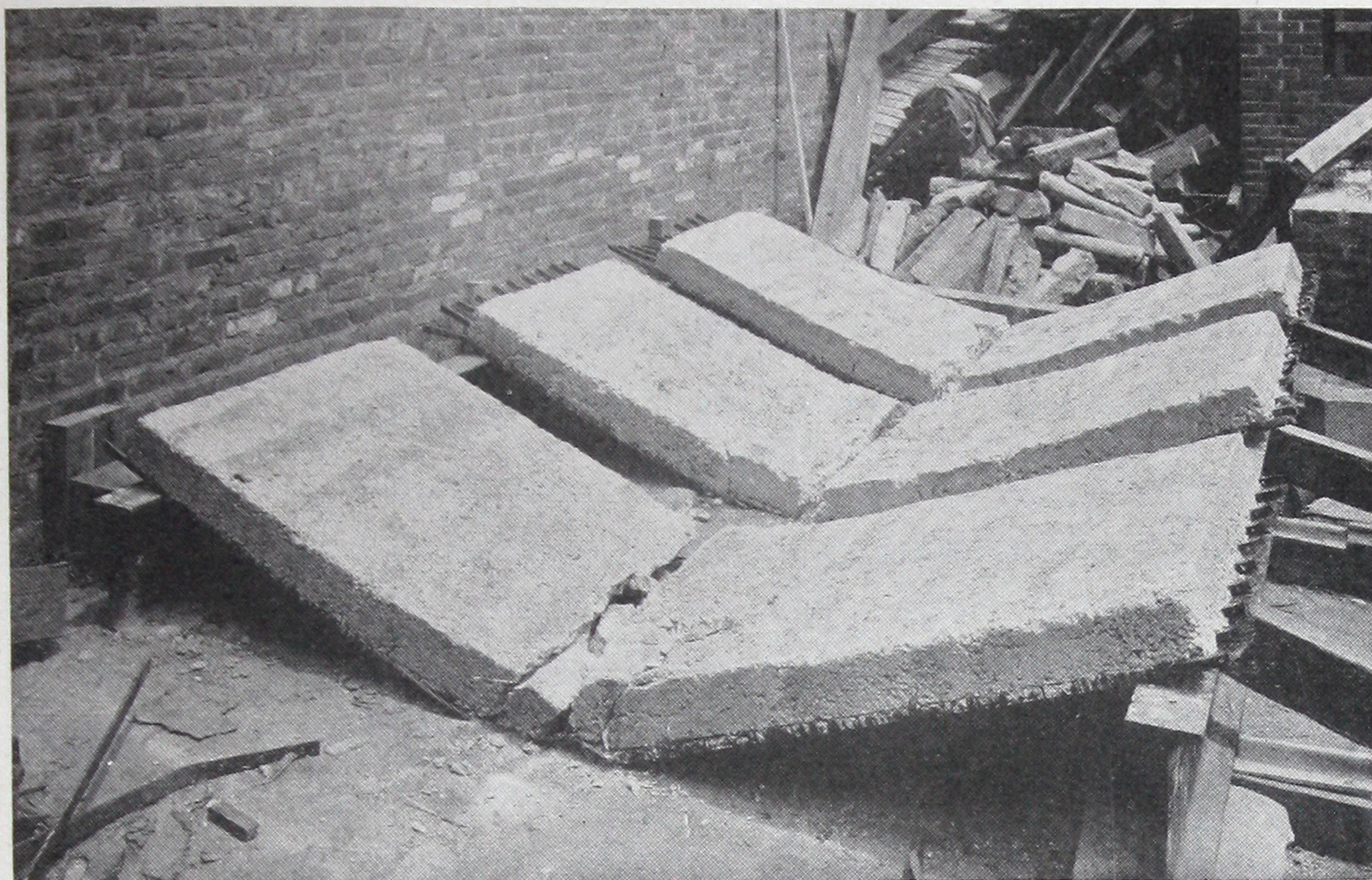
Mr. John Lloyd Raff, Contractor, Philadelphia, Pa.

Mr. A. D. Neeld, Jr., C. E., Fireproofing Engr., with Lumbermen's Supply Co., Wichita, Kas.

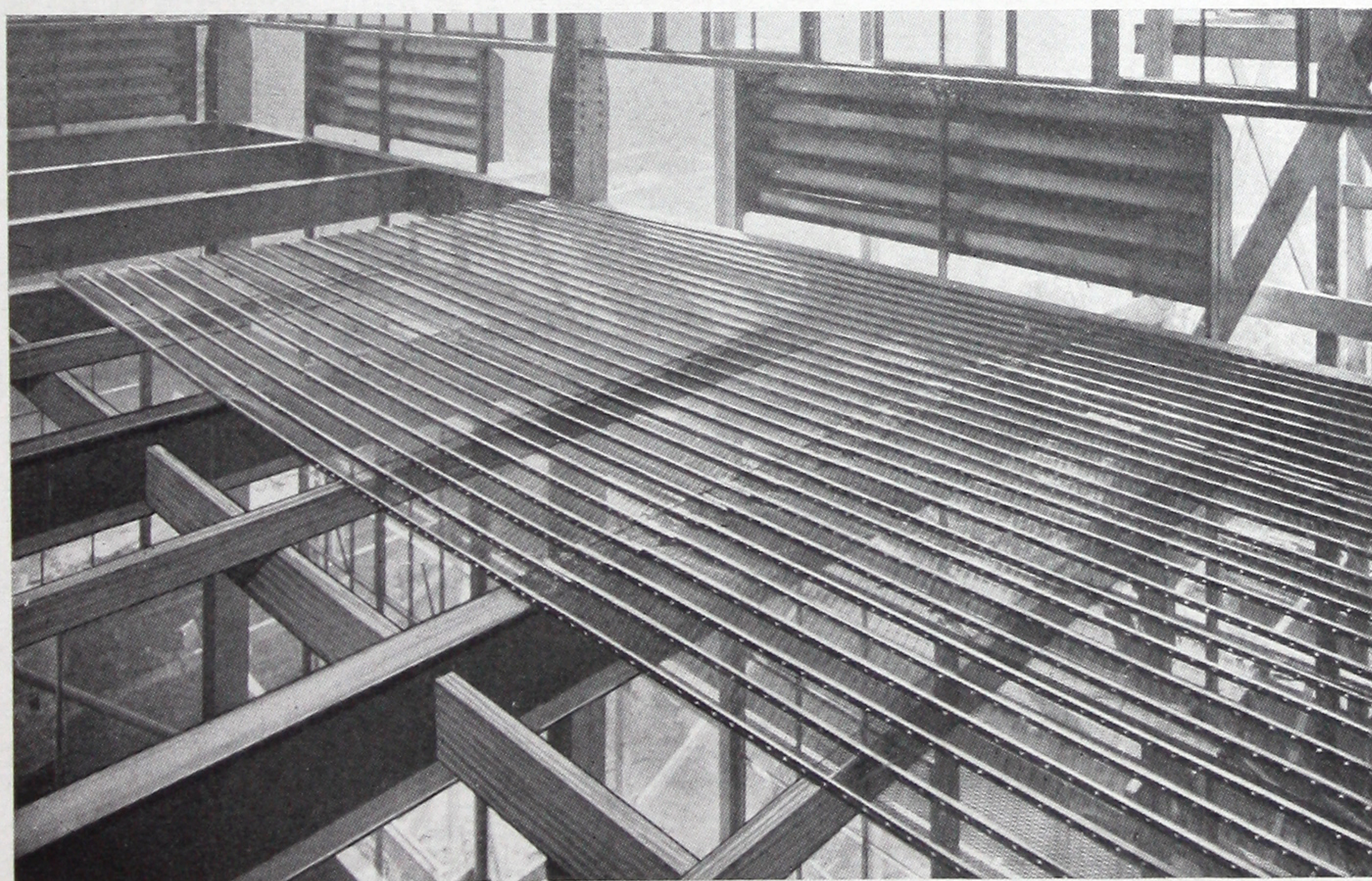
Mr. James W. Pearce, Pearce Fireproof Co., Philadelphia, Pa.

Mr. Wm. J. Carr, Building Superintendent, Philadelphia, Pa.

T - R I B C H A N E L A T H



T-Rib Chanelath Slabs After Testing to Destruction



T-Rib Chanelath in Place for Flat Slab. Note Temporary Support

T - R I B C H A N E L A T H

Suggested Specifications for Roofs and Floors

General

All concrete roofs and floors, as indicated on the plans, shall be constructed without forms by using T-Rib Chancelath, . . . gauge.

The slabs shall be . . inches thick as indicated on the drawings, this thickness to be above the T-Rib Chancelath.

The T-Rib Chancelath is to be placed with the ribs up and running at right angles with the supports. Chancelath is to be secured to steel framing by clips or by wiring with No. 18-gauge annealed tie wire. Where the framing is of wood, the Chancelath is to be fastened with heavy wire staples. If the framing is to be reinforced concrete, the Chancelath will be supported by the beam forms, and the sheets must be long enough to extend at least 1 inch into the beam after the concrete is poured.

No loads shall be placed on the Chancelath before placing the concrete and not until the concrete has set. Planking shall be placed over the Chancelath along the supports for runways.

Temporary Supports

Temporary supports shall be used for all spans exceeding . . feet and must be placed so that no spans exceed this distance. These temporary supports must remain in place until the concrete has permanently set.

Arched Floors

The T-Rib Chancelath for all arched floors will be furnished curved to the proper radius by the manufacturer. Where the arches are supported by steel beams, the Chancelath will rest on the lower flanges of the beams. Where the beams are of reinforced concrete, the Chancelath will be supported by the forms for the bottom of the beams until the concrete has been poured.

T - RIB CHANELATH

Splicing

Sheets shall be spliced at the ends as recommended by the manufacturer or other method approved by the architect or engineer. Unless splices are made over supports, they are to be staggered at least 2 feet.

Sheets shall be joined together at the sides every 24 inches by use of the Chanelath Punch recommended by the manufacturer, or by wiring at least every 24 inches with No. 18-gauge annealed tie wire.

Concrete

The portland cement used in this work shall meet the test of the American Society for Testing Materials.

The sand must be clean and free from all organic matter, and uniformly graded from coarse to fine.

The stone must be hard, dense and clean, and of a size to pass through a 1/2-inch ring.

Hydrated lime shall be uniform in quality and perfectly hydrated.

Mixing Concrete

The concrete shall be thoroughly mixed by machine or hand in the proportion of 1 of portland cement, 2 of sand, 4 of stone, and hydrated lime not exceeding 10% of the portland cement.

In mixing the concrete for the slabs, use only an amount of water sufficient to thoroughly wet the mass to a good troweling consistency.

Finishing

The surface is to be floated smooth, and after the concrete has set sufficiently the under surface of the slab is to be plastered with one coat of mortar, proportioned 1 part portland

T - RIB CHANELATH

cement, $2\frac{1}{2}$ parts sand, and hydrated lime not exceeding 10% of the Portland cement or other approved plaster. The usual amount of hair or fibre shall be used with this coat.

The finished concrete shall be kept thoroughly dampened for at least two days after it has been poured, either by sprinkling or covering with burlap or canvas.

Expansion Rods

Where the dimension of the roof is over 200 feet in a direction at right angles to the ribs of the Chanelath, place $\frac{3}{8}$ -inch rods, 36 inches apart, on top of the ribs and at right angles to them. These rods to be wired to alternate T-ribs with No. 18-gauge tie wire.



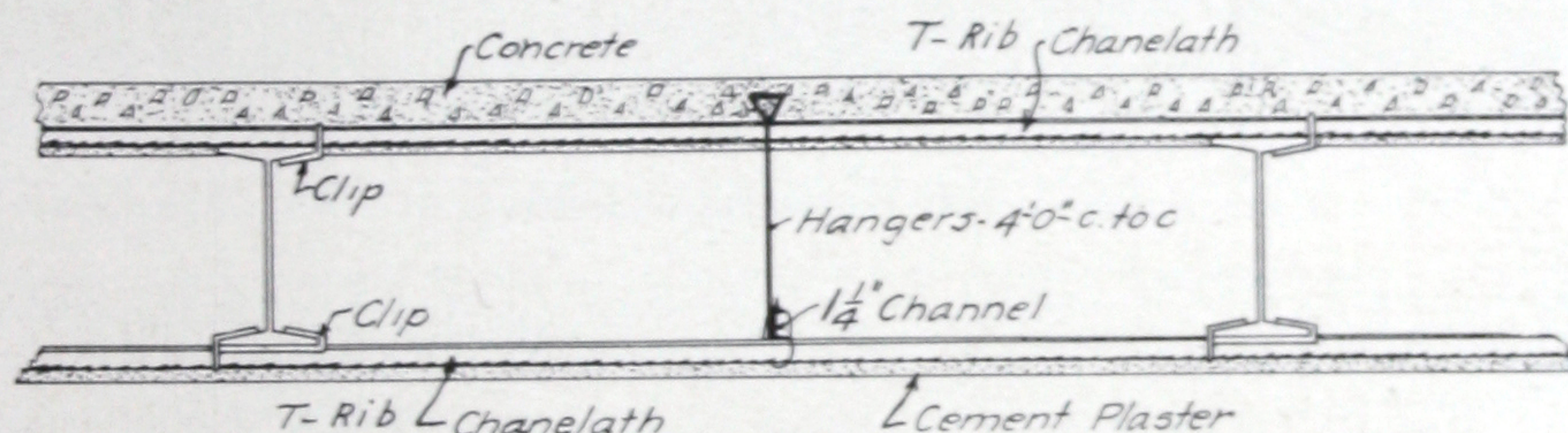
Pouring Concrete on a T-Rib Chanelath Roof of a Garage Building
Wichita, Kansas

T-RIB CHANELATH

T-Rib Chanelath Ceilings

For fireproof and suspended ceilings, Chanelath offers a combined furring and lathing that lessens the time of erection and very materially reduces the cost of the construction. The heavy T-ribs take the place of the furring usually used in ceiling work, and the fabric joining the T-ribs provides the lathing surface.

Supports may be spaced from 4 to 6 feet center to center when Chanelath is used as a support for plastered ceilings, without the use of any auxiliary furring or supports, because the heavy T-ribs act as furring and stiffen the plastering surface more effectively than any system using flat sheet lath and furring.



Chanelath ceiling below reinforced concrete floor supported by steel beams. Where the beams have a greater distance, center to center, than the maximum given above, auxiliary runners and hangers must be used.

Chanelath ceilings are of two general types. They are either fastened directly to the floor or roof beams, or are suspended by hangers and runners at some distance below those beams.

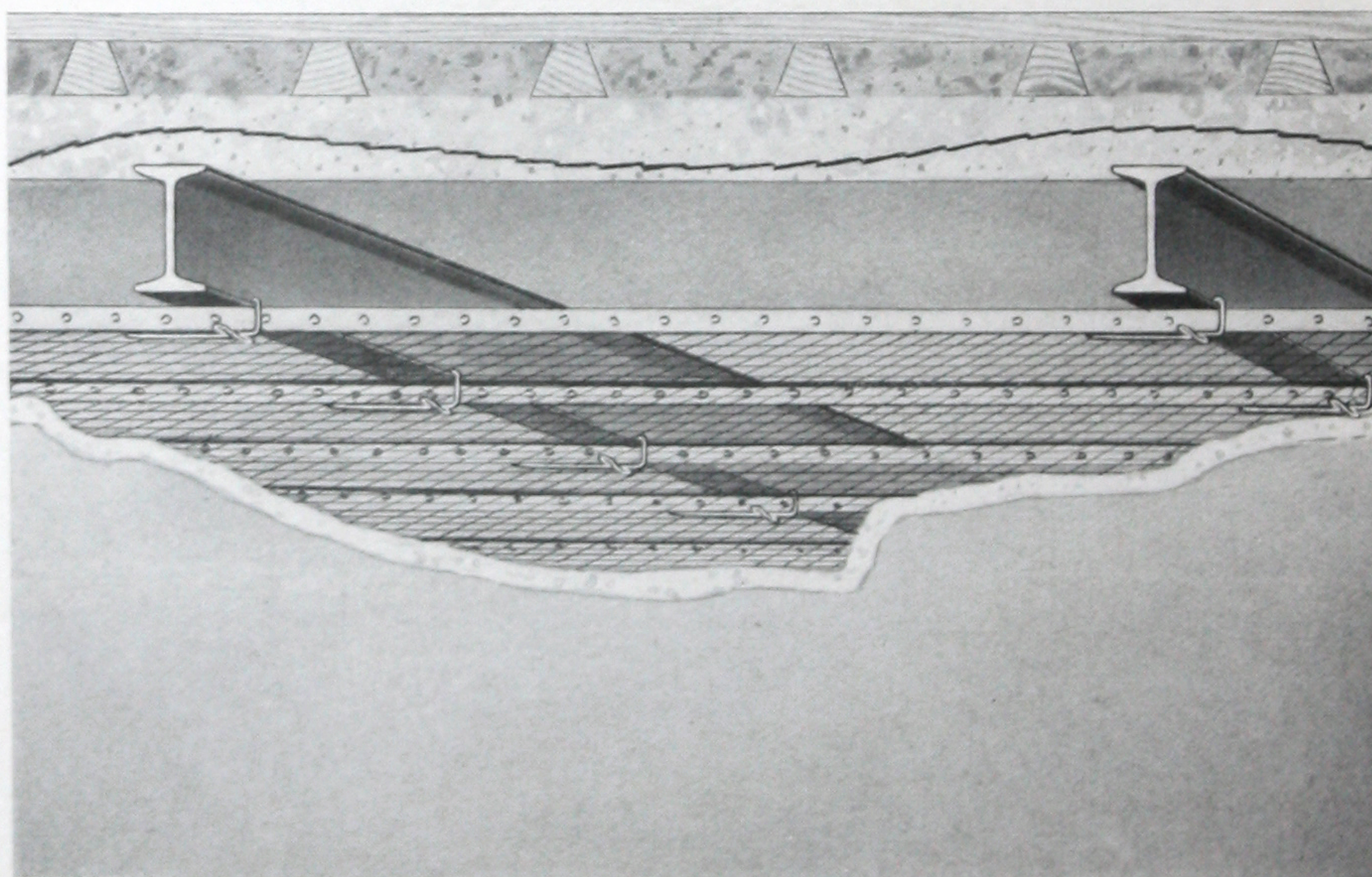
The illustration above shows the method of erecting a Chanelath ceiling when the material is attached directly to the steel floor beams. The T-Rib Chanelath is placed with the ribs up and fastened to the bottom flanges of the beams with a clip.

T-RIB CHANELATH

T-Rib Chanelath Ceilings



A T-Rib Chanelath Ceiling

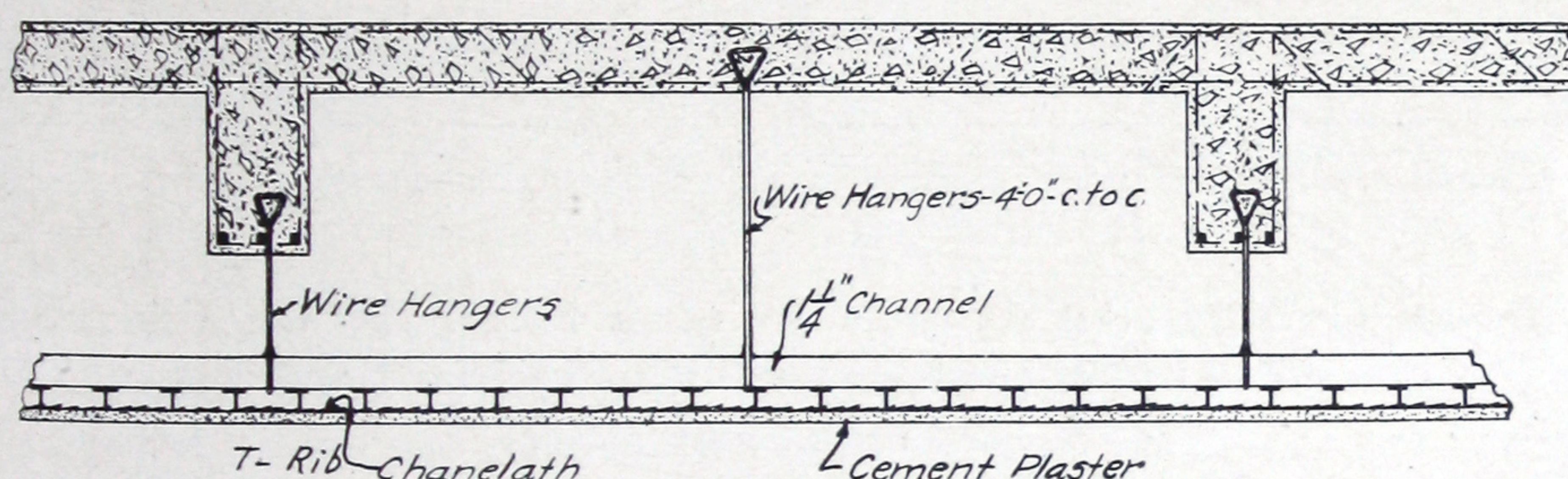


T-Rib Chanelath Ceiling Hung from Steel Beams

T - RIB CHANELATH

The hangers and runner are only required when the spacing of the beams exceeds 4 feet.

Where the ceiling is attached directly to the under surface of the floor beams, Chanelath is fastened to the lower flanges of the beams by placing a clip on each rib where it crosses a floor beam. If the ceiling is to be suspended or the floor beams are such a distance apart that extra supports must be provided, these are hung from the floor above and the Chanelath clipped or wired to these extra supports, which usually are $\frac{1}{4}$ -inch by 2-inch runner bars hung by $\frac{1}{4}$ -inch round rods.



Method of Supporting Chanelath Ceiling Below Reinforced Concrete Floor Supported by Concrete Beams

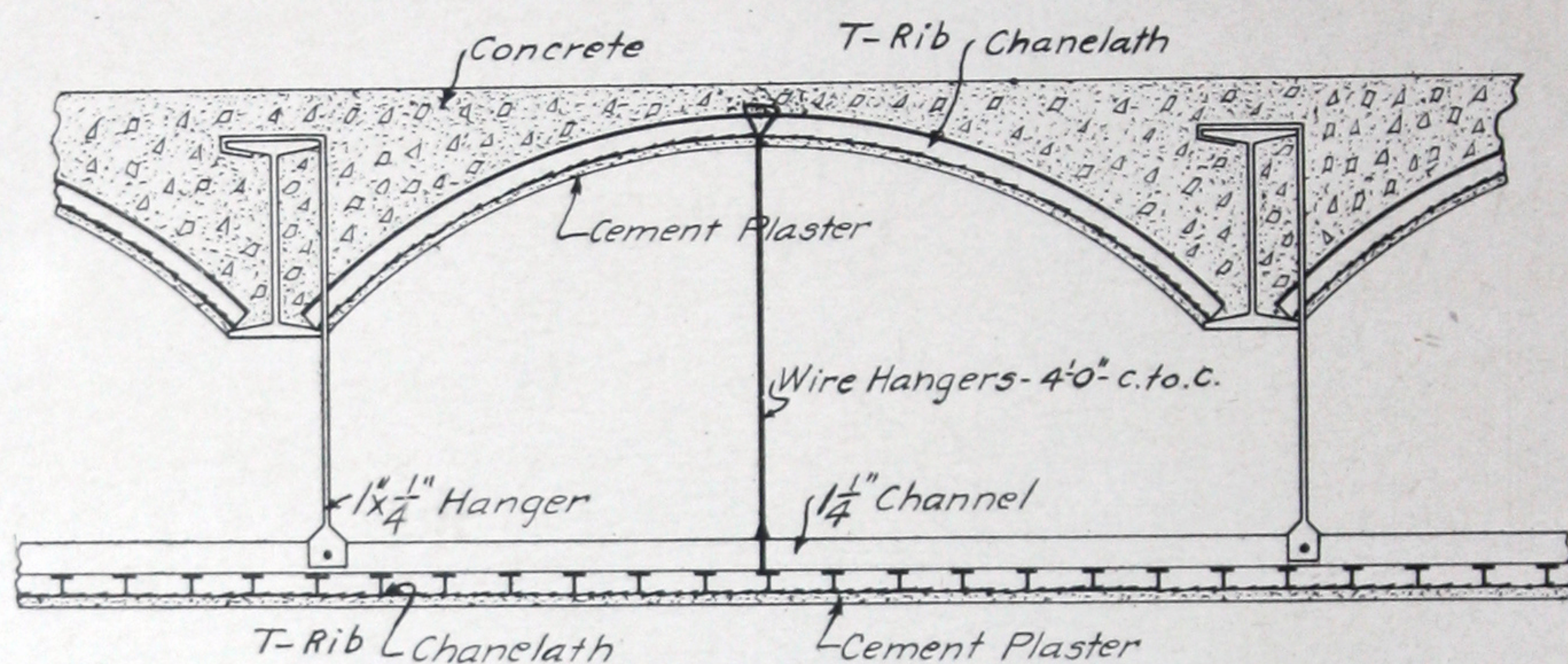
The above illustration shows the method followed when the ceiling is to be suspended below reinforced concrete beams. The T-Rib Chanelath can be brought up close to the bottom of the beams if desired by using short hangers.

The same method is followed when the ceiling is to be suspended below steel beams, except that the hangers at the beams are hooked over the steel beam.

By selecting the proper gauge of T-Rib Chanelath, the use of auxiliary hangers and runners can frequently be avoided, as the stiffness of the T-ribs permits the use of Chanelath without supports on spans from 4 to 6 feet.

T - RIB CHANELATH

The illustration below shows the method of supporting a Chanelath ceiling when the steel beams are encased in concrete. This method is used with either an arched floor, as shown, or with a flat slab floor.



Method of Supporting Chancelath Ceiling Below Arched Chancelath Floors. Auxiliary Hangers are Required for Long Spans Between Floor Beams

In addition to the strength of T-Rib Chancelath ceilings, there are some advantages from the viewpoint of the plasterer that make this construction a labor and time saver. The plastering surface is stiffened every 4 inches by the heavy T-ribs, so that there is no sagging of the lath when the wet plaster is applied. The ribs are solid and there are no breaks in the plastering surface or any portion of the material where the plaster is only held by adhesion to a smooth steel surface. Every inch of Chancelath plastering surface contains a perfect "key." At the sides the sheets do not have to be fitted over each other, so there are no ribs or projections to cause cracking along the line of splicing. There are few splices because of the large size of the sheets of T-Rib Chancelath.

T - RIB CHANCELATH

Suggested Specifications for Suspended Plastered Ceilings

All suspended ceilings shall be plastered over T-Rib Chancelath, applied and supported as shown on detail drawings and as outlined in these specifications.

Runners of $1\frac{1}{2}$ by 3-16-inch flat iron (or 2-inch by $\frac{1}{4}$ -inch flat, or $1\frac{1}{4}$ -inch channels) shall be suspended from the floor or roof above by hangers of $\frac{1}{4}$ round rods spaced 4 feet center to center. Hangers shall be securely fastened to construction above in accordance with the details shown, or other standard details approved by the architect.

The Chancelath shall be attached with the ribs up and each rib is to be securely wired with No. 18-gauge annealed tie wire to the runners. Sheets shall be spliced by the methods recommended by the manufacturer or other method approved by the architect. The sides of sheets are to be securely fastened together with the Chancelath Punch or tied with No. 18-gauge annealed tie wire.

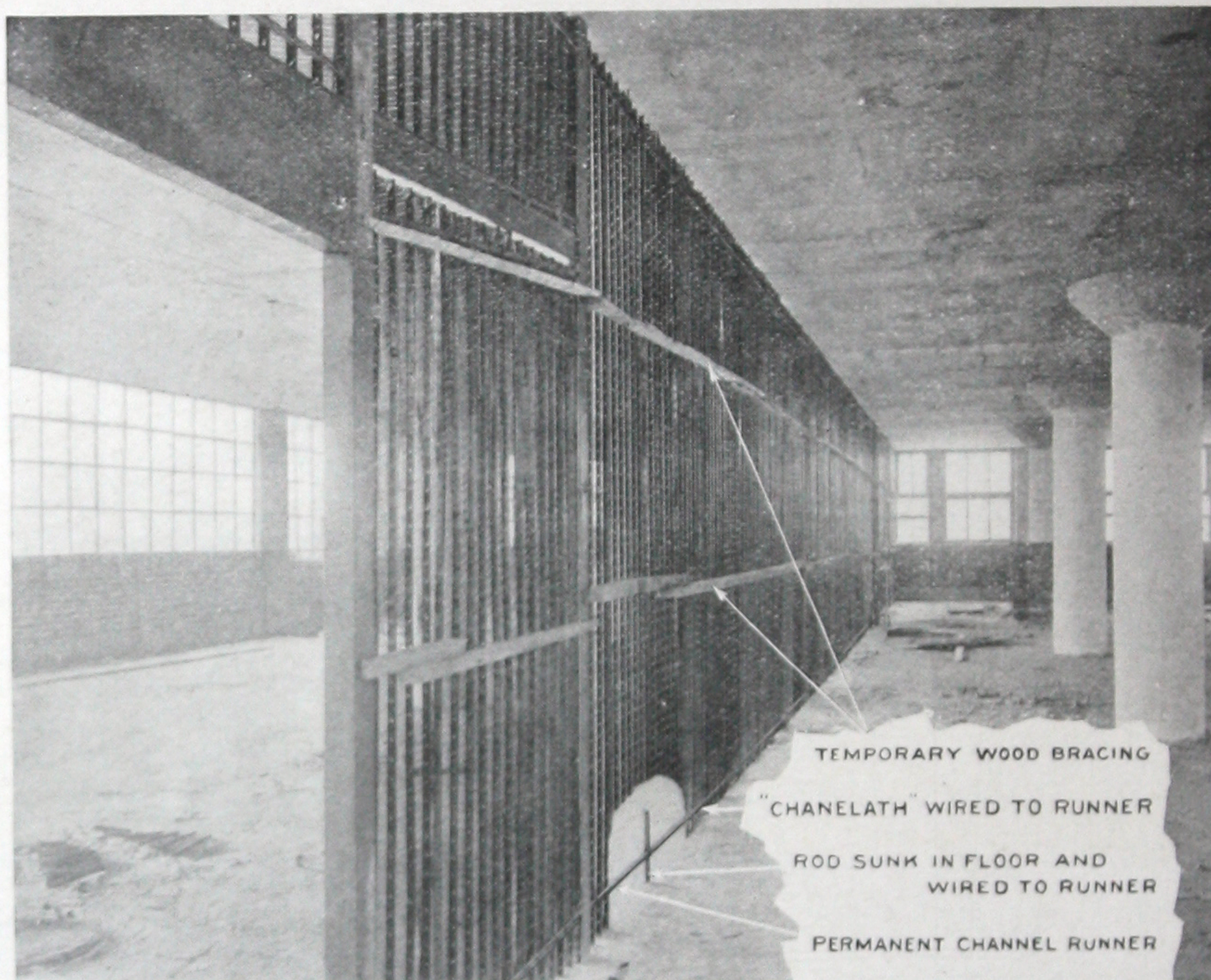
For ceilings suspended directly from steel beams, the Chancelath is to be applied in the same manner, but fastened to the flanges at the beams at each rib with clips. If the steel beams are more than 4 feet center to center, auxiliary runners must be placed between the beams in the manner specified above.

Where floor beams are of wood, the Chancelath may be stapled directly to the beam with $1\frac{1}{2}$ -inch staples, one staple being used over each rib. If beams are more than 4 feet center to center, auxiliary runners must be used.

T - R I B C H A N E L A T H

T-Rib Chanelath Partitions

T-Rib Chanelath offers to the builder a material for use in partition work that will eliminate a vast amount of time and labor, and in consequence will result in greater economy in building operations. The heavy T-ribs of Chanelath provide the studding or furring and at the same time so stiffen the plastering surface that the plaster is easily and quickly applied.

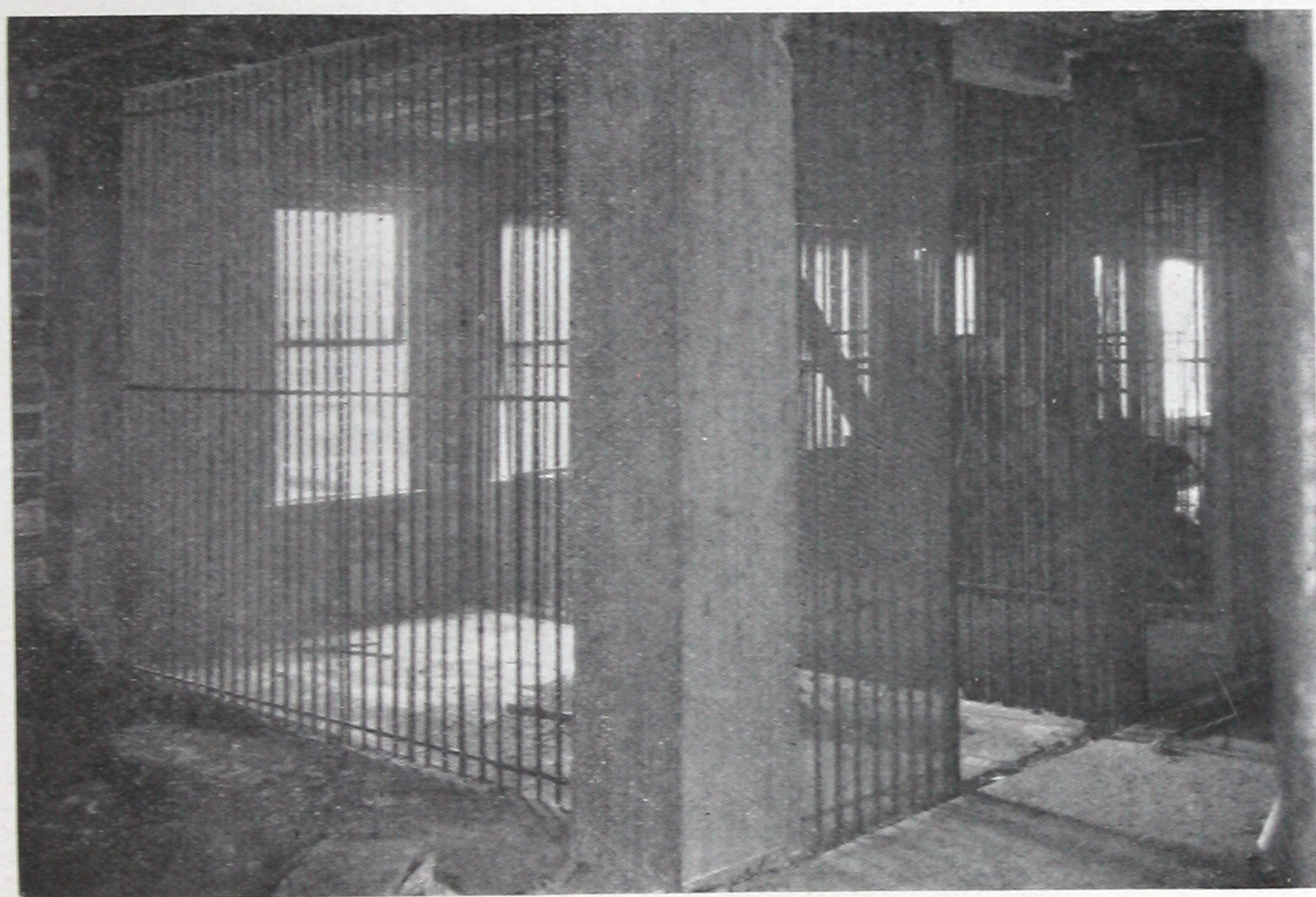


T-Rib Chanelath Partition in a Box Factory

Chanelath is adaptable for use as a base for the plaster on any type of partition, but it is specially suitable for use in the construction of solid plaster partitions. The T-ribs act as studding and brace the lath so that a rigid partition of great strength is secured. The mesh of the plastering surface, being the Kno-Burn mesh, insures ease in plastering.

T - RIB CHANELATH

T-Rib Chanelath partitions can be erected in less time than is required for any other type of partition. The material is furnished in large sheets, thereby reducing the number of connections to be made between sheets. The sheets are furnished in a number of lengths, to fit practically every height of story usually encountered, without having to resort to splicing. A further saving in time may be effected by fastening several sheets together with the Chanelath Punch and erecting a large section of the Chanelath at a time.



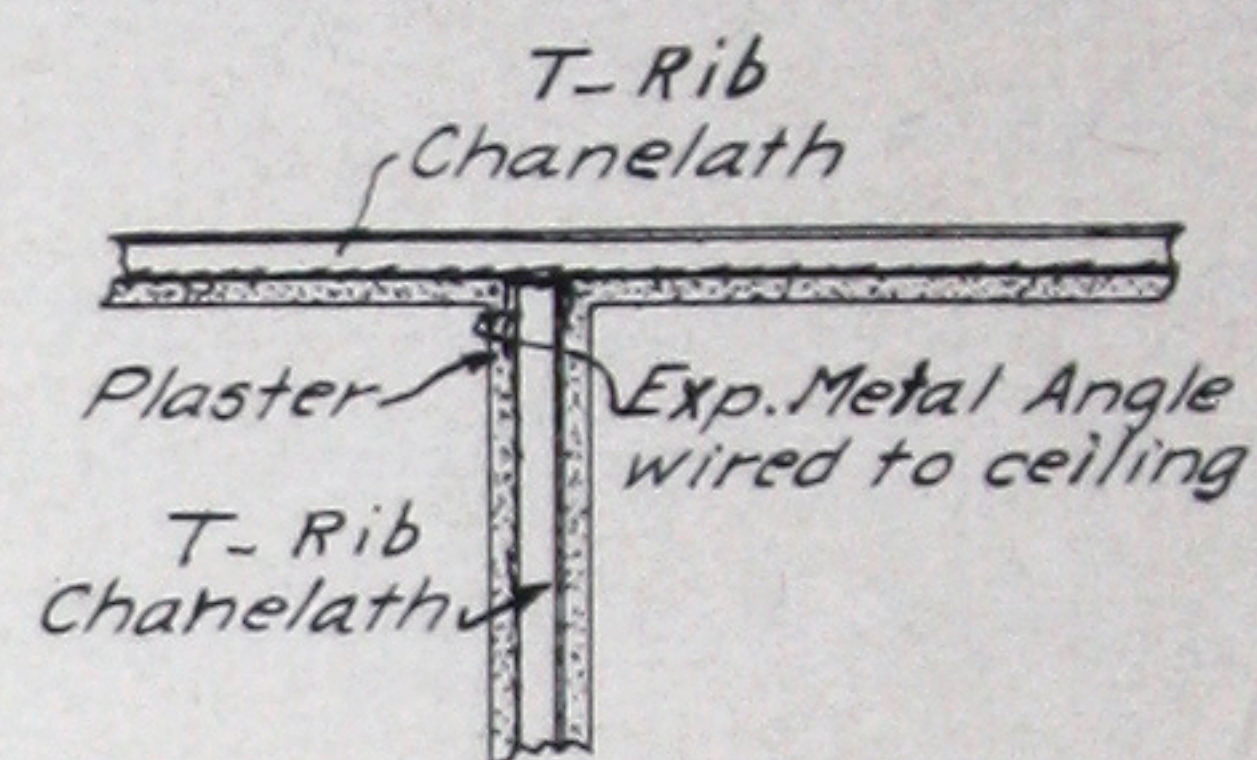
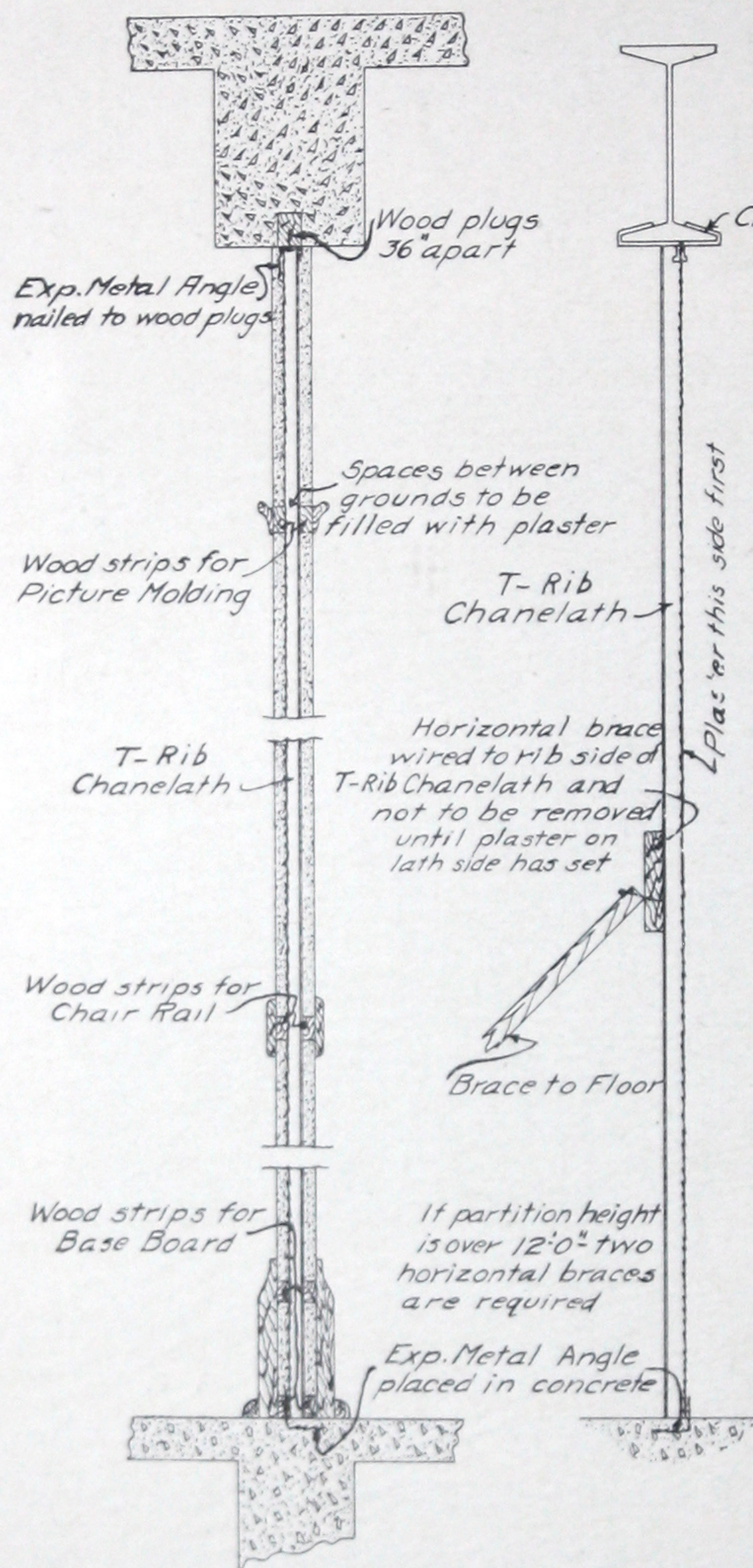
Corridor Partitions of T-Rib Chanelath

The use of T-Rib Chanelath partitions results in a very material saving in space and in weight to be carried by the structure as a dead load. A Chanelath partition 2 inches thick can be used in place of the ordinary construction, which requires a partition with a thickness of 4 to 6 inches. The 2-inch Chanelath partition will only weigh 18 pounds per square foot of surface, which is very much less than any other type of partition. This reduction in weight permits the use of lighter

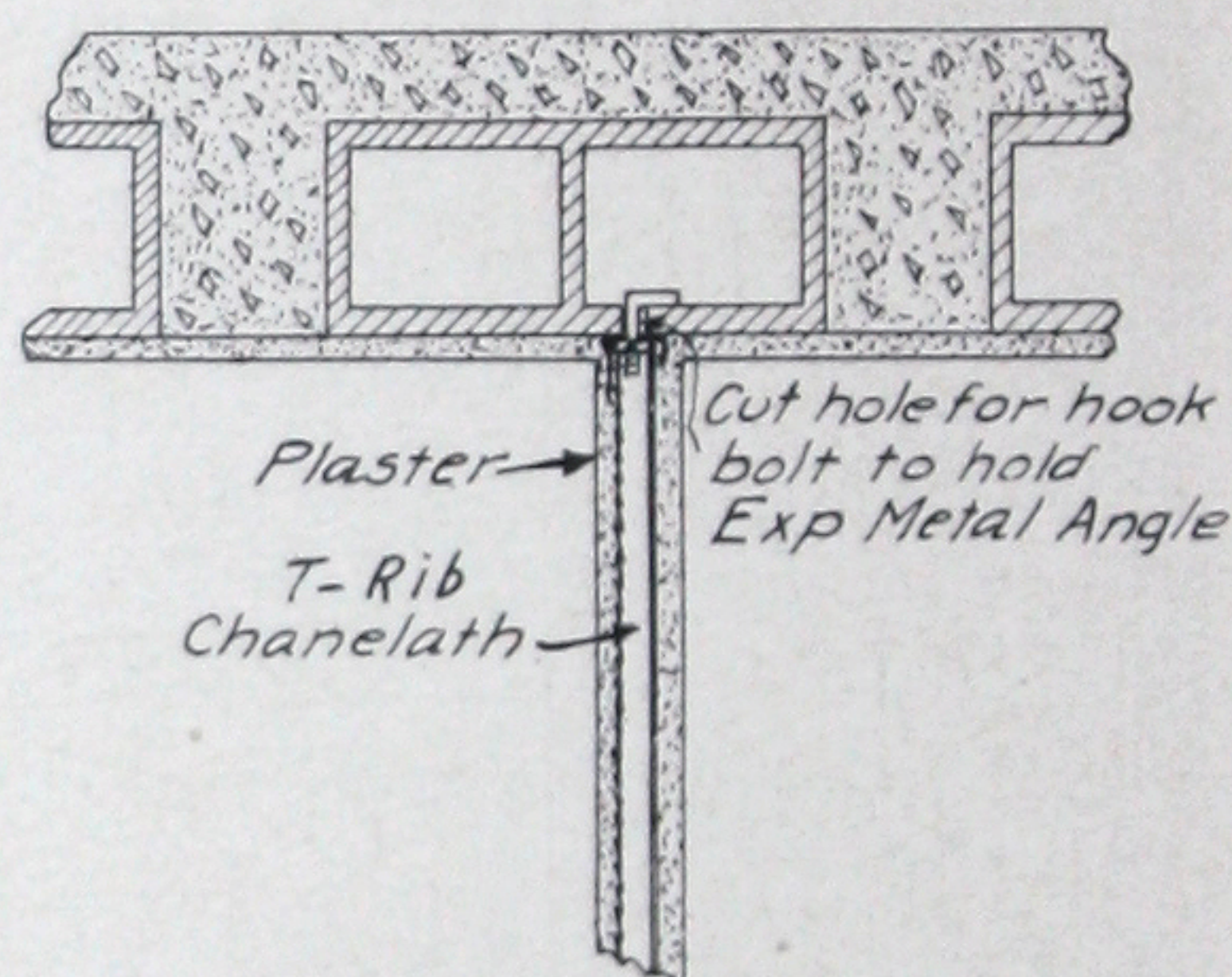
T - RIB CHANELATH

structural members throughout the building, and on large structures the saving in weight will result in a saving in foundation work.

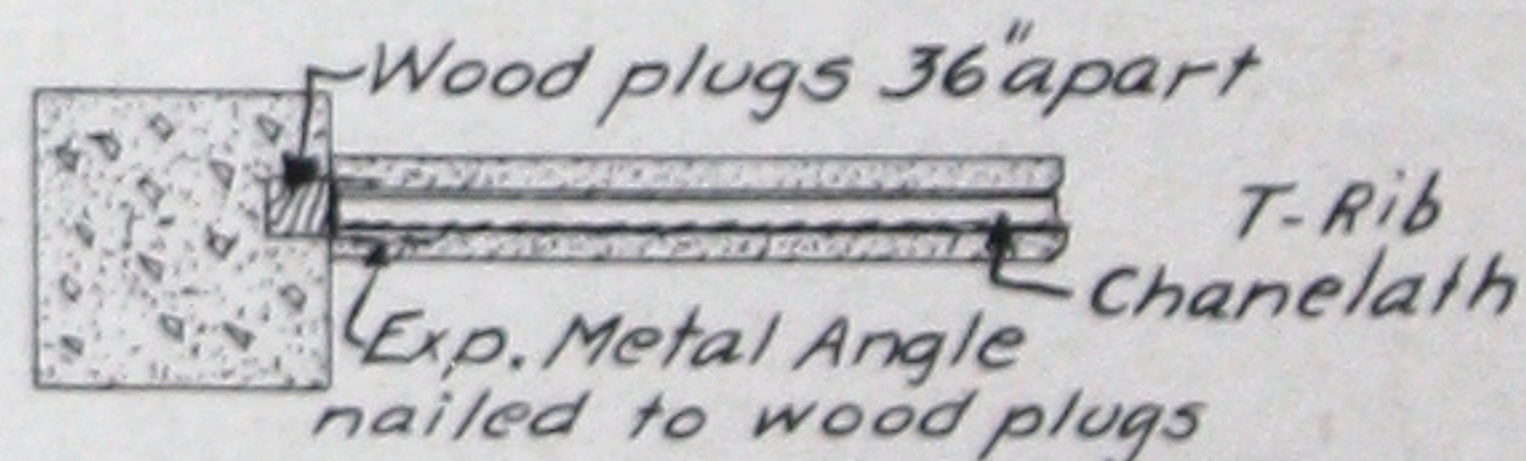
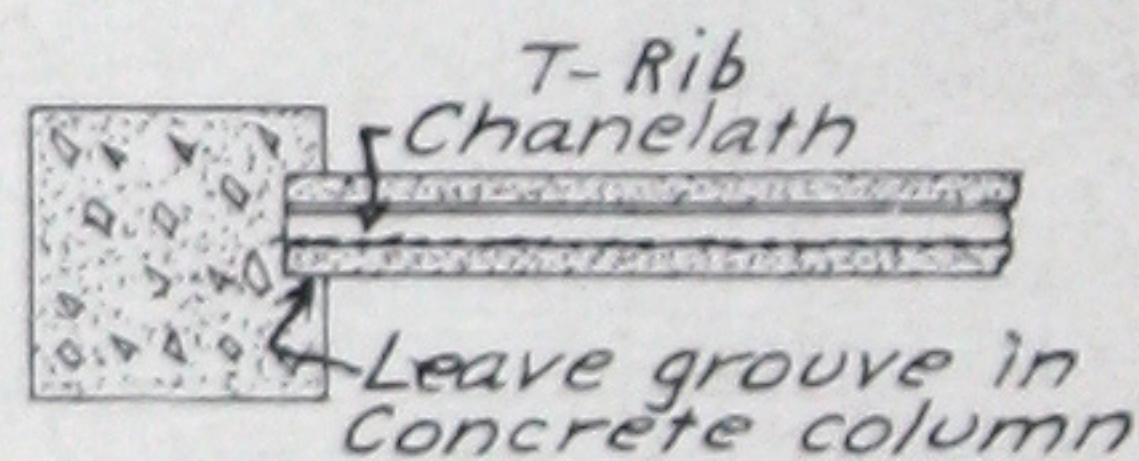
Suggested T-Rib Chanelath Partition Details



METHOD OF ATTACHING T-RIB CHANELATH PARTITIONS TO SUSPENDED CEILINGS



METHOD OF ATTACHING T-RIB CHANELATH PARTITIONS TO HOLLOW TILE CEILINGS



TWO METHODS OF ATTACHING T-RIB CHANELATH PARTITIONS TO CONCRETE COLUMNS

T - RIB CHANELATH

A few of the details of erecting T-Rib Chanelath partitions are illustrated on page 54.

The typical cross-section shows the finished partition and illustrates the manner of providing grounds for fastening of wooden trim. The same method may be easily adapted where metal trim is used. This illustration shows the chanelath fastened to the concrete at the floor by means of the expanded metal runner angle, and to the ceiling by hangers and a channel.

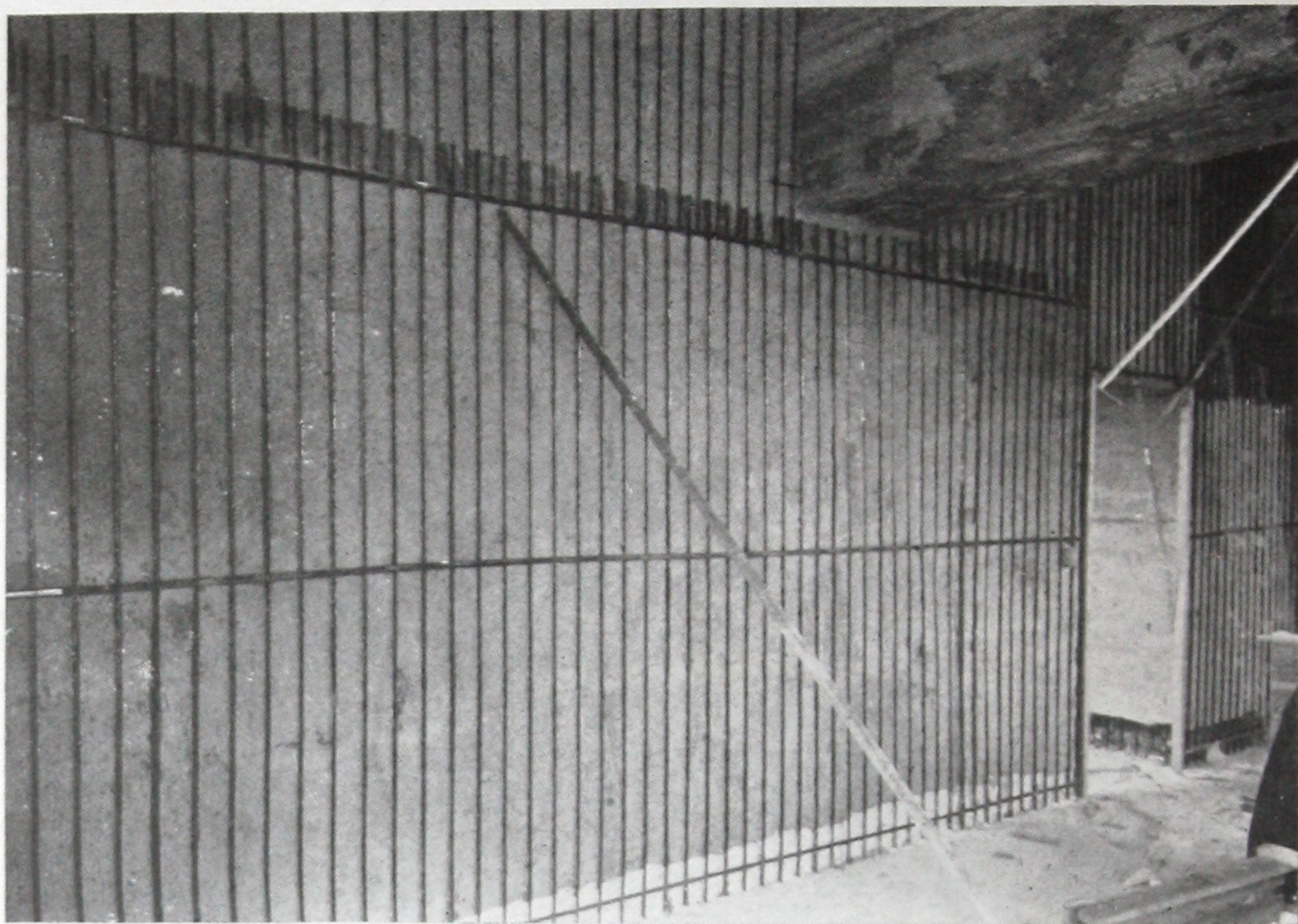
The detail of the temporary bracing can be readily understood from the illustration. This bracing is placed every 6 feet in height of the partition, consequently there are but few partitions that will require more than one temporary horizontal brace. This brace is fastened to the rib side of the Chanelath and is removed after the first coat of plaster applied to the lath side has become thoroughly set. The bracing may then be used on other partitions in the same building.

Where it is not desirable to use the expanded metal runner angle, the Chanelath may be fastened to a runner consisting of a channel or angle, using No. 18-gauge lathers' tie wire. The runner can be fastened to concrete construction by means of expansion bolts or other approved method, to tile by toggle bolts, and to wood by nailing. Another method of erecting Chanelath for partitions is to place a deep 1-inch formed channel on the ceiling and insert the end of the sheet in this, fastening the lower end to an angle on the floor.

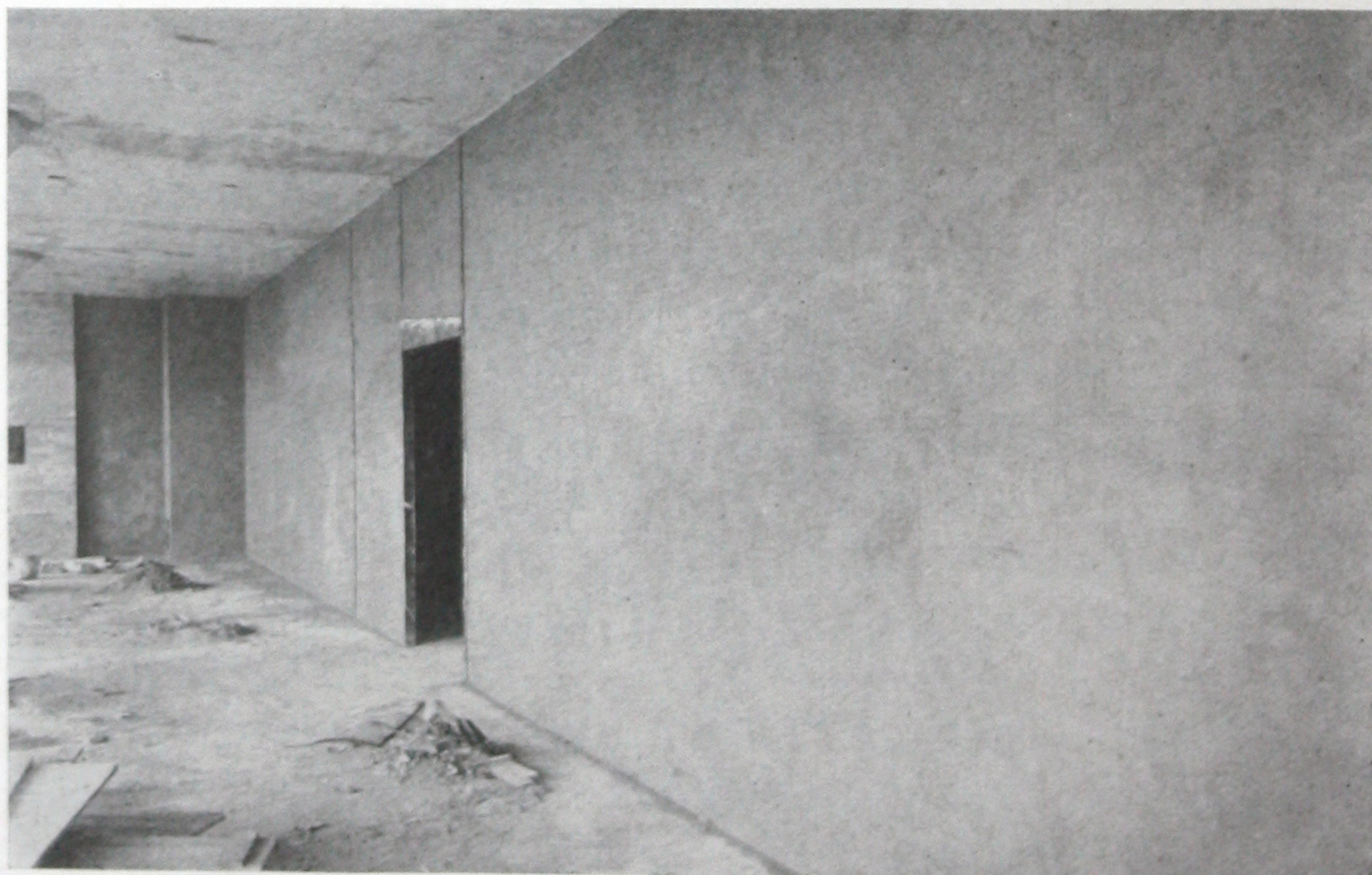
A few of the special problems that come up in connection with the use of Chanelath for partitions are shown in the smaller illustrations on the opposite page. The method of fastening Chanelath to columns is used when the spacing between columns permits the placing of the Chanelath with the ribs running horizontally. Other practical methods for erecting Chanelath partitions will suggest themselves to the workman as he uses the material.

T - RIB CHANELATH

T-Rib Chanelath Partitions



T-Rib Chanelath Partitions in Y. M. C. A., Cincinnati, Ohio



T-Rib Chanelath Partition, Plastered

T - RIB CHANELATH

Suggested Specifications for T-Rib Chanelath Partitions

T-Rib Chanelath is to be used for all interior partitions, as shown in the plans, the size used to be in accordance with the following table:

Height of Partition.	Gauge of Chanelath.
Up to 12 feet.....	No. 28 gauge
From 12 to 16 feet.....	No. 26 gauge
From 16 to 18 feet.....	No. 24 gauge

The Chanelath is to be erected with the ribs running the shortest way of the span, which in most cases will be vertically.

Temporary supports shall be placed 6 feet on centers. If the ribs of the Chanelath run vertically, horizontal cross pieces shall be placed 6 feet on centers and braced to the floor. Temporary supports shall remain until after the first coat of plaster has set. The first coat of plaster shall be applied to the lath side, and the temporary bracing shall be applied to the rib side and shall have the ribs securely wired to it.

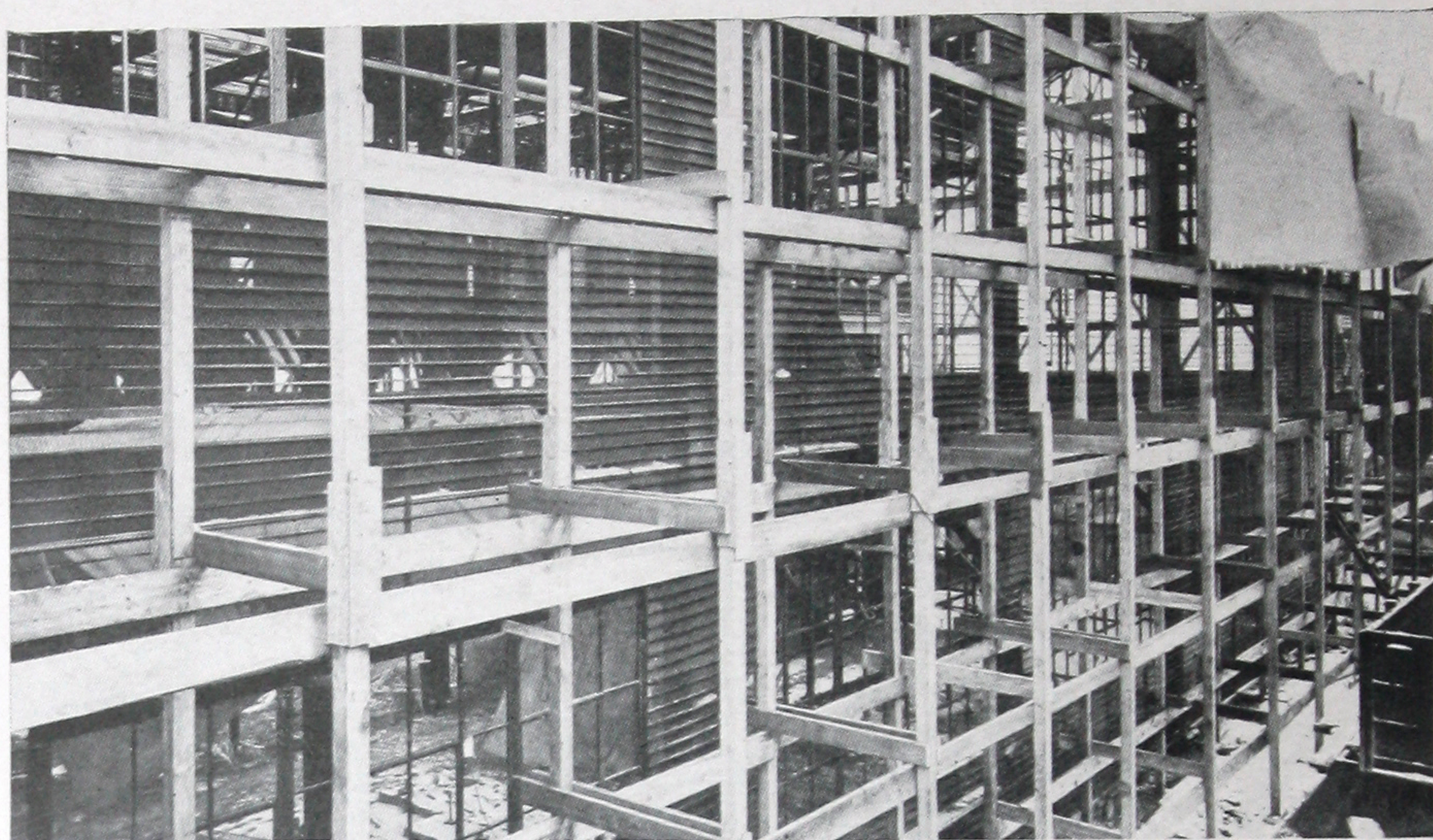
The Chanelath shall be firmly and securely attached to the floor and ceiling construction by expanded metal runner angles or other method approved by the architect.

Sides of sheets shall be fastened every 4 inches by the Chanelath Punch or by wiring with No. 18-gauge annealed tie wire.

Wherever splicing is necessary, the sheets shall be furnished arranged for splicing by the manufacturer or the splicing done on the work shall be approved by the architect.

Where baseboards, chair rails, picture molding, etc., are required, small nailing blocks, preferably of fireproof composition, shall be securely attached to the Chanelath before the plaster is applied.

T-Rib Chancelath Curtain Walls



T-Rib Chancelath Erected for Factory Curtain Wall



A Section of a Curtain Wall, Showing Method of Using Chancelath Punch

T - R I B C H A N E L A T H

T-Rib Chanelath Curtain Walls

T-Rib Chanelath covered with portland cement provides a reinforced concrete curtain wall for factories, storehouses, piers, etc., that is economical, attractive, permanent and fire-proof. The slabs can be made thin and still provide ample strength for the purpose.

The erection of T-Rib Chanelath for this purpose is simple and rapid, and very similar to that described for the construction of solid plaster partitions. No studding or forms are required, as the Chanelath is fastened directly to the structural members of the building which are required to support the floors and roof. A clip or No. 18-gauge wire is used to secure the Chanelath to the steel members. The sides of the sheets are fastened with the Chanelath Punch, as shown in the illustration at the bottom of page 58.

This construction is specially adapted for use on industrial buildings, and T-Rib Chanelath is very economical to use for this work because of the large number of stock sizes in which it is furnished. T-Rib Chanelath is manufactured in sheets varying by 4 inches from a width of 4 inches up to and including 4 feet. (2 foot widths are the most easily handled.) The stock lengths of T-Rib Chanelath also help to reduce to a minimum the waste that would otherwise occur due to cutting the sheets to fit around openings. These stock lengths are 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 feet.

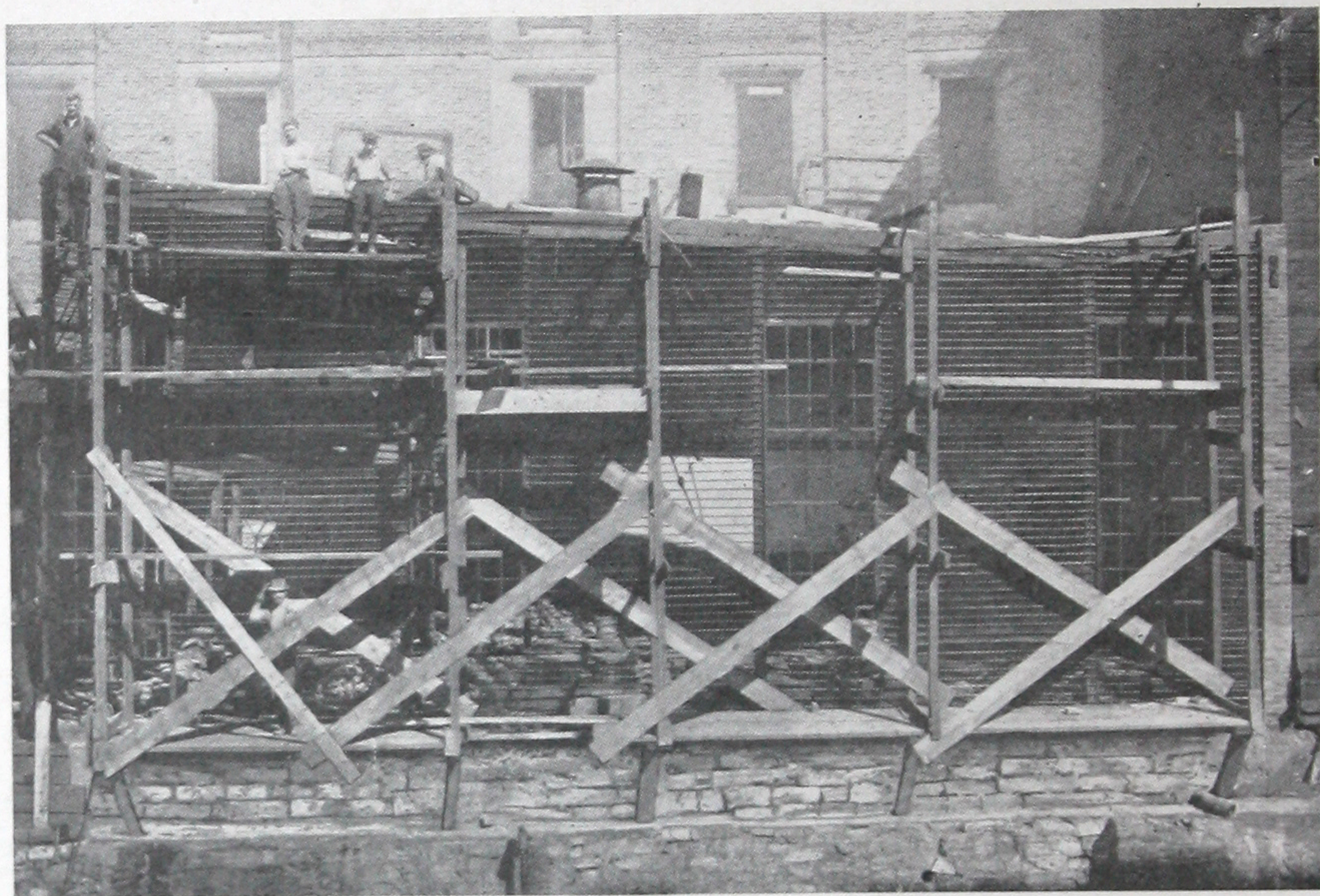
After the T-Rib Chanelath has been erected, portland cement plaster is applied to both sides of the material, making the wall 2 inches or more thick. Practically any thickness of wall desired may be secured, this being dependent entirely upon the number of coats of plaster applied.

The Chanelath curtain wall presents a finished appearance from the day it is completed and never requires any repairs or painting. It is fireproof, and if used in conjunction with fireproof windows the manufacturer can feel assured that his property is well protected.

T - R I B C H A N E L A T H

T-Rib Chancelath Exterior Walls

Probably there is no other type of building that requires such frequent alterations and additions as the industrial or factory building. The superintendent of a modern plant will find T-Rib Chancelath specially adapted for this particular work. It provides a form and reinforcing for floors and roofs, and the ideal base for exterior walls of cement.



T-Rib Chancelath for Exterior Walls of Engine Room

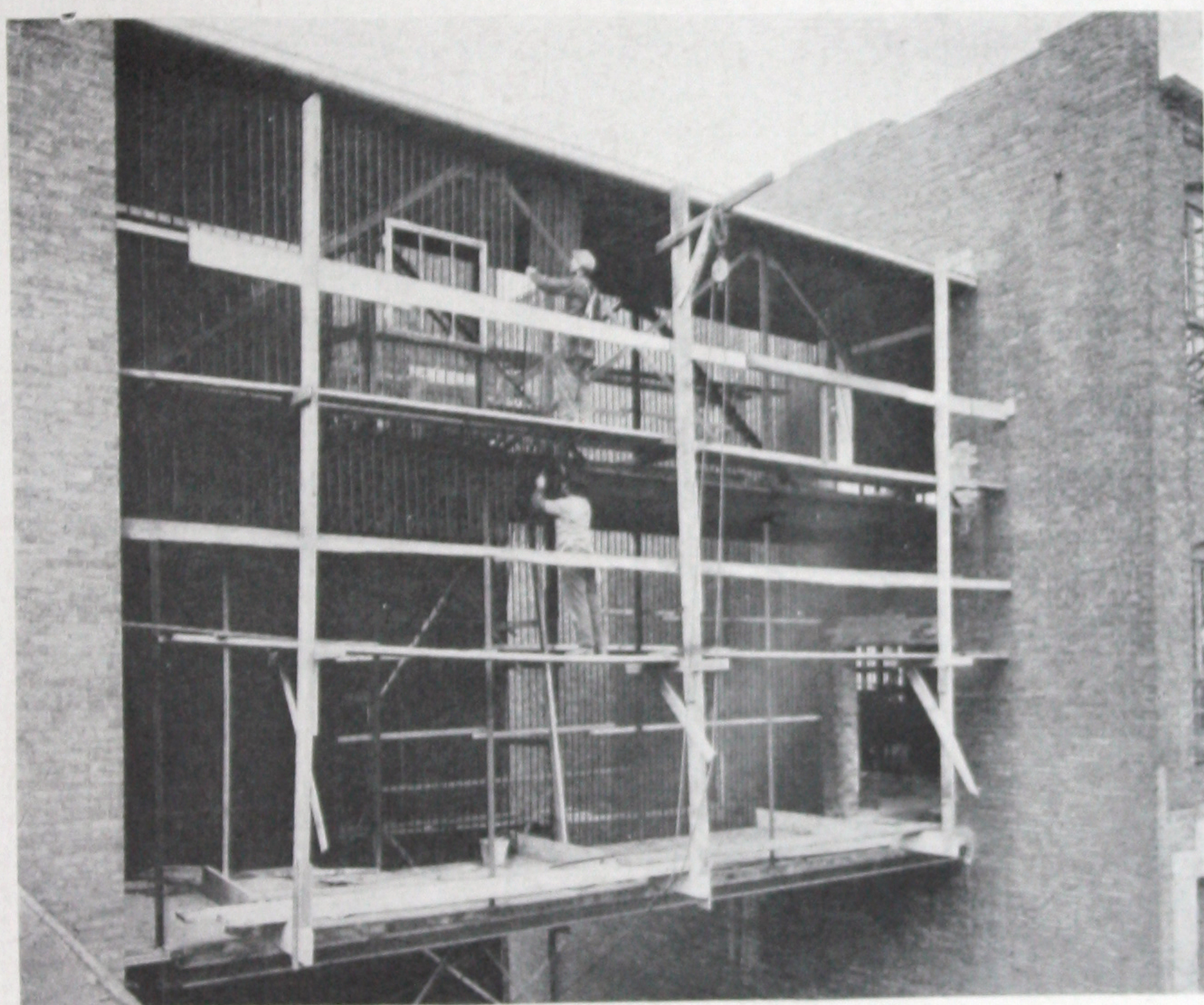
In the illustration above, Chancelath is being applied to the exterior wall of an addition to a power plant. The T-Rib Chancelath sheets are fastened directly to the structural steel framework by means of clips. The wall will be finished with portland cement plaster applied to both sides of the Chancelath and finishing 2 inches thick.

The illustration on page 61 features a class of construction that is frequently found in connection with manufacturing plants. Factory buildings are erected close together but with

T - RIB CHANELATH

no means of communication. Later development makes it necessary to provide passageways between the buildings.

Usually it is essential that the space between the two buildings be left free of obstruction at the ground level to permit the passage of trucks, etc., which was the case in this instance. This necessitates the supporting of the frame of the passageway on the existing walls of the buildings.

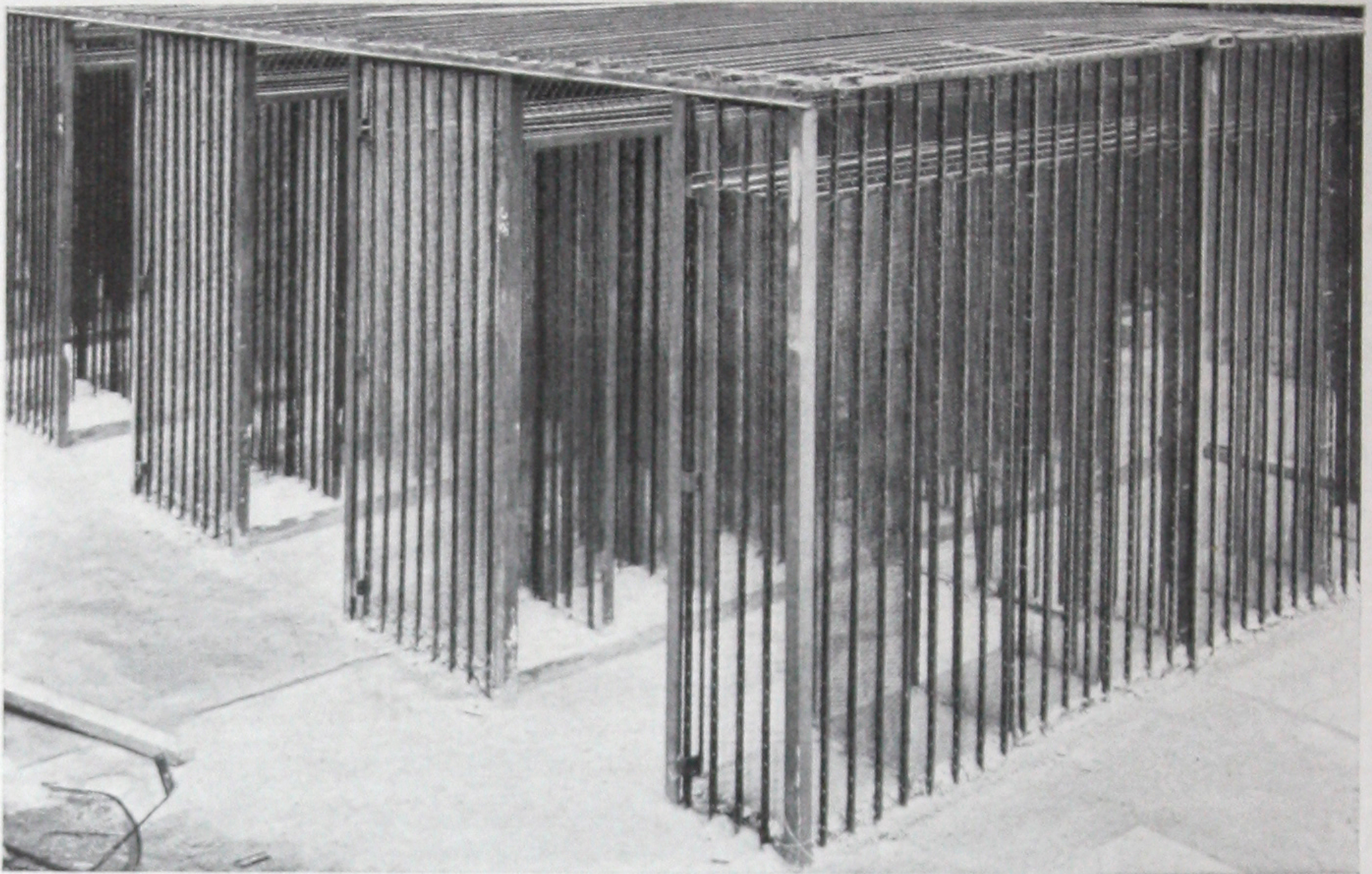


In this particular case the passageway is two stories in height and the framework consists of light weight, structural steel members braced to act like a truss. The floors are of heavy planks resting on channels.

To reduce the weight of the passageway to a minimum and at the same time secure a permanent fireproof construction, it was decided to make the walls of portland cement plaster and T-Rib Chanelath.

T - RIB CHANELATH

T-Rib Chanelath Lockers



Frame of T-Rib Chanelath for Concrete Lockers



The Finished Locker Before Placing Steel Doors

T - R I B C H A N E L A T H

T-Rib Chancelath Lockers

The illustrations on page 62 show T-Rib Chancelath erected for the construction of reinforced concrete lockers for a Chicago bathing beach. A frame of light structural steel was first erected on a concrete foundation. The sheets of Chancelath were cut to the approximate length required at our factory, so there was little cutting done on the work. The material was fastened to the structural iron by wiring with No. 18-gauge wire.

T-Rib Chancelath was used for the roof as well as the sides of these lockers. The under side of the Chancelath used for the roof was plastered before the concrete was poured, thus reversing the usual practice in this respect. The roof was given a slight pitch in placing the concrete. All wiring conduits were encased in the concrete.

The first coat of the portland cement plaster was applied to the inside of the lockers. After this had set the exterior coats were applied and finished off smooth, as shown in the illustration of the completed lockers.

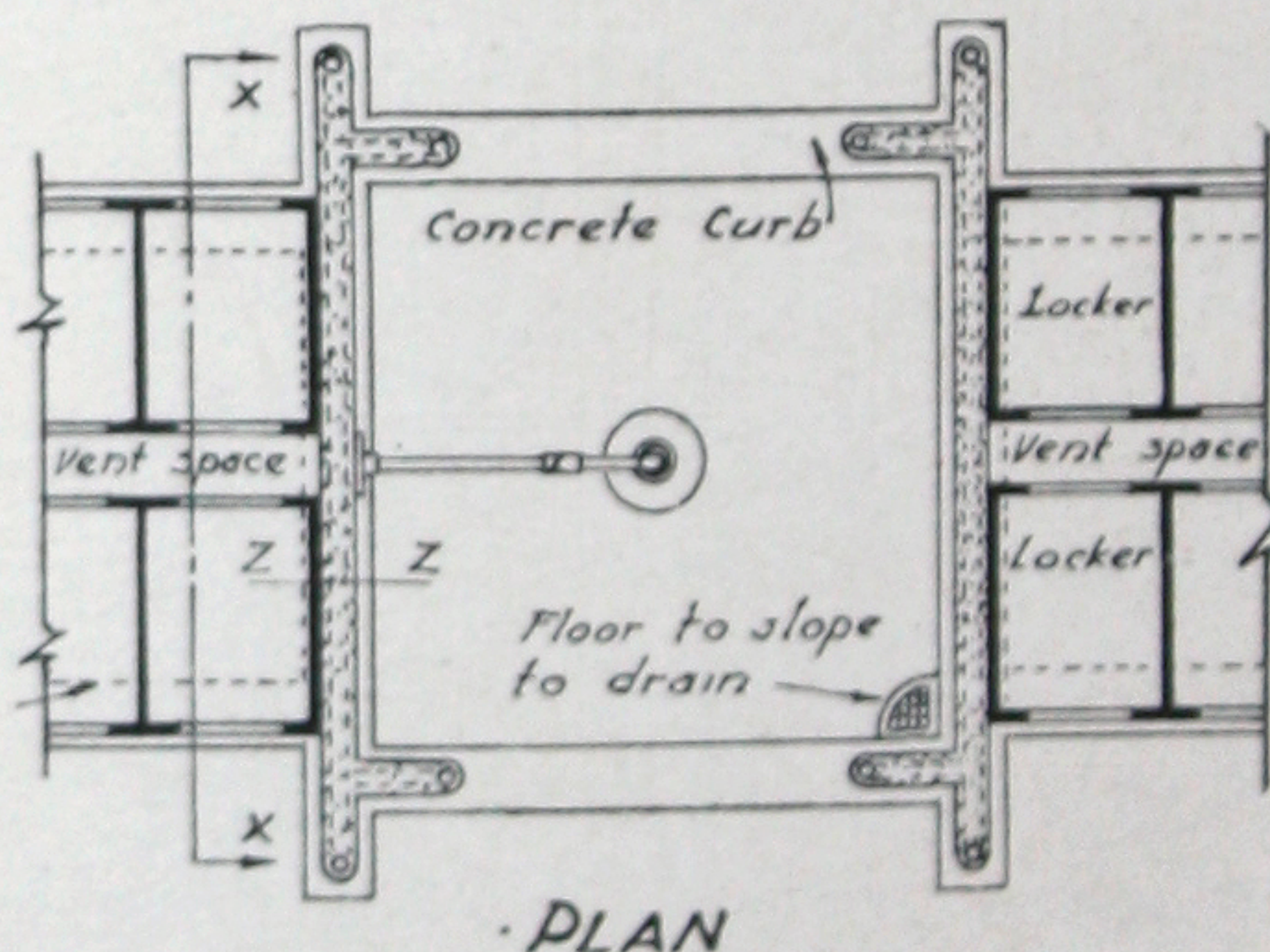
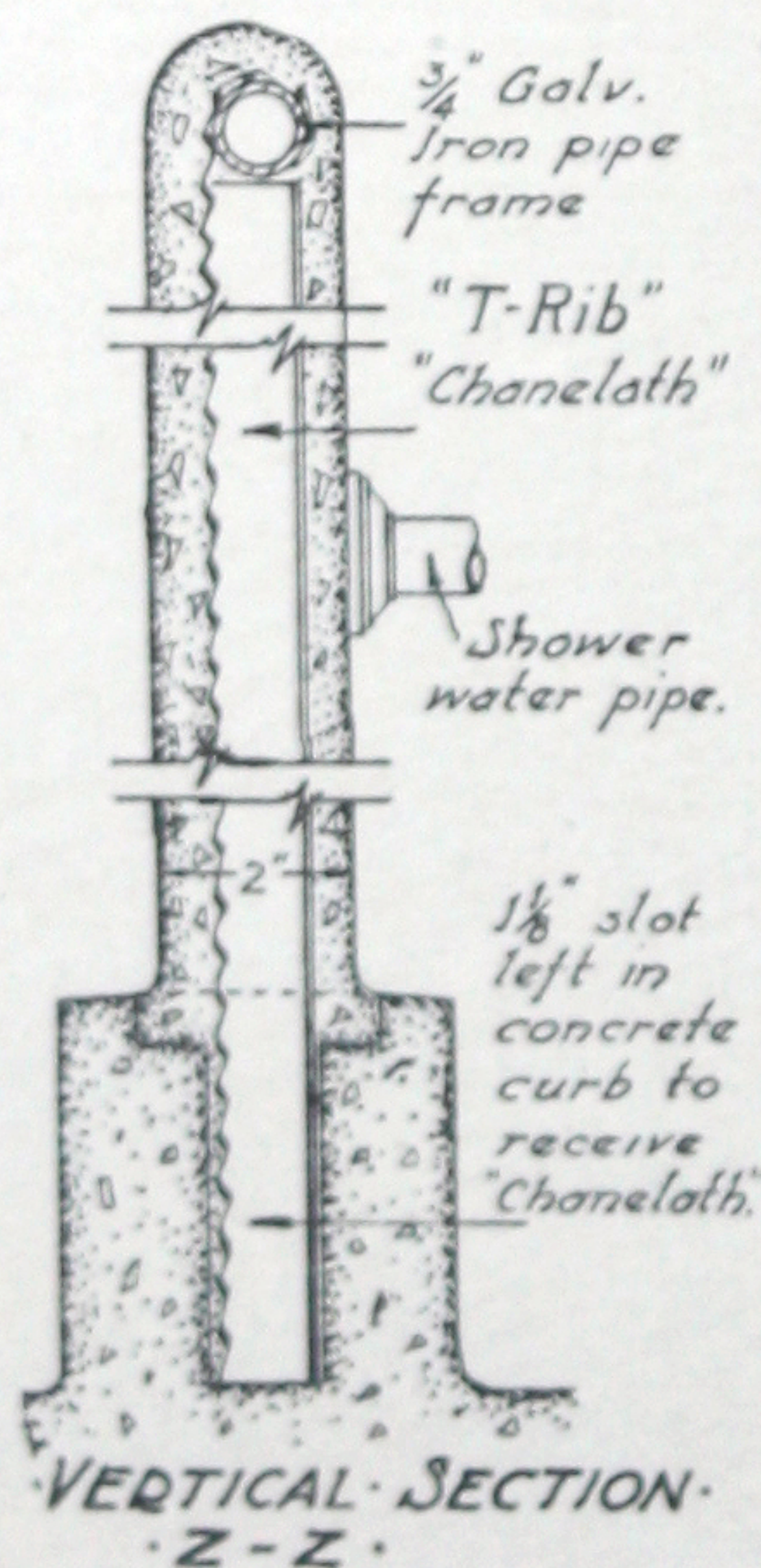
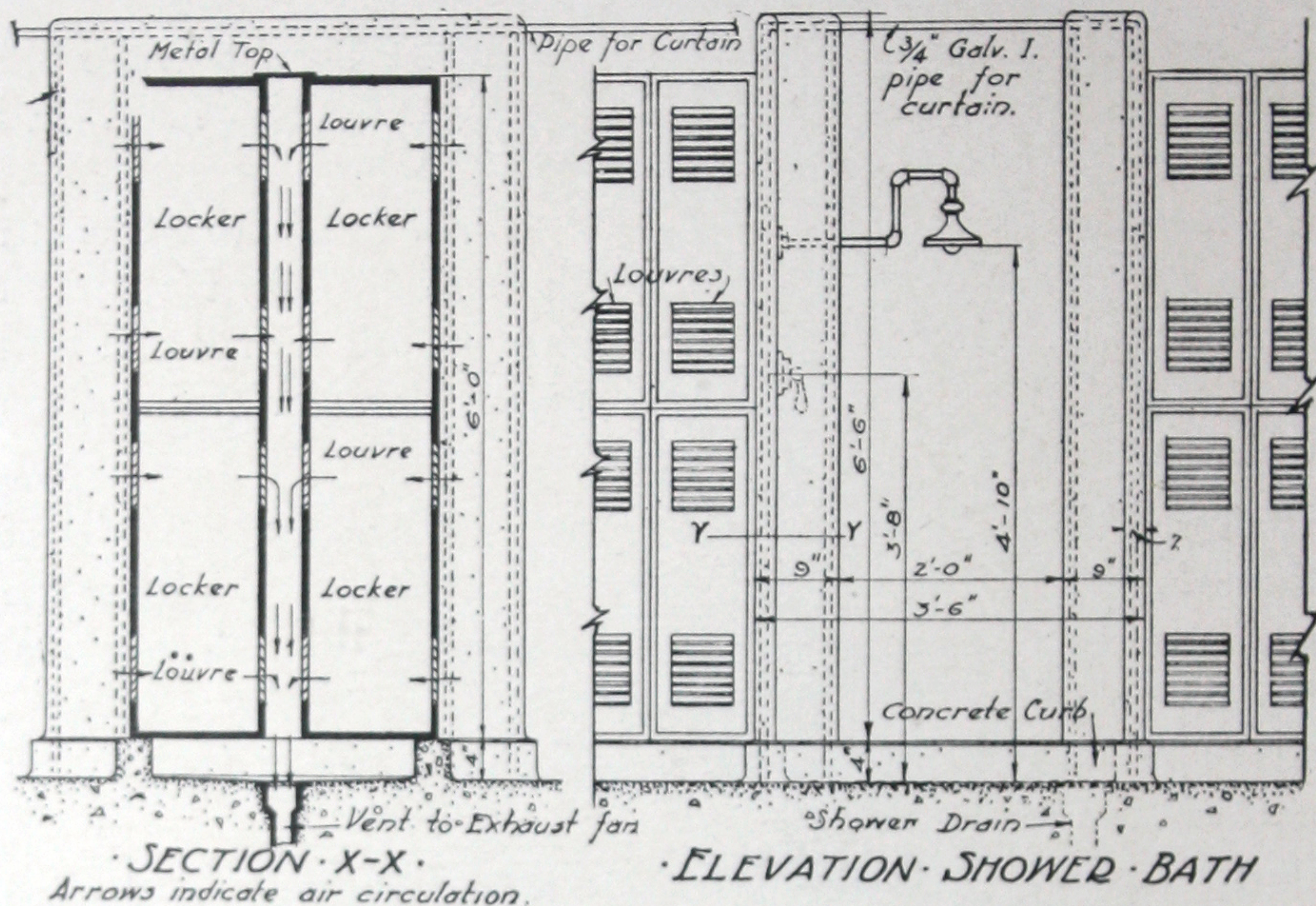
This construction provides a locker system that is fireproof and sanitary. The entire lot can be thoroughly and completely cleaned out with a hose. The construction is permanent and will not require repairs every season.

This construction can be used in factories, mines, schools, institutions, gymnasiums, and every location where permanence and sanitation is considered of importance. As the construction is of light weight, it can be used on any floor of a building without greatly increasing the dead load.

Details of another method for using T-Rib Chancelath for shower bath and toilet room stalls, etc., are given on the next page.

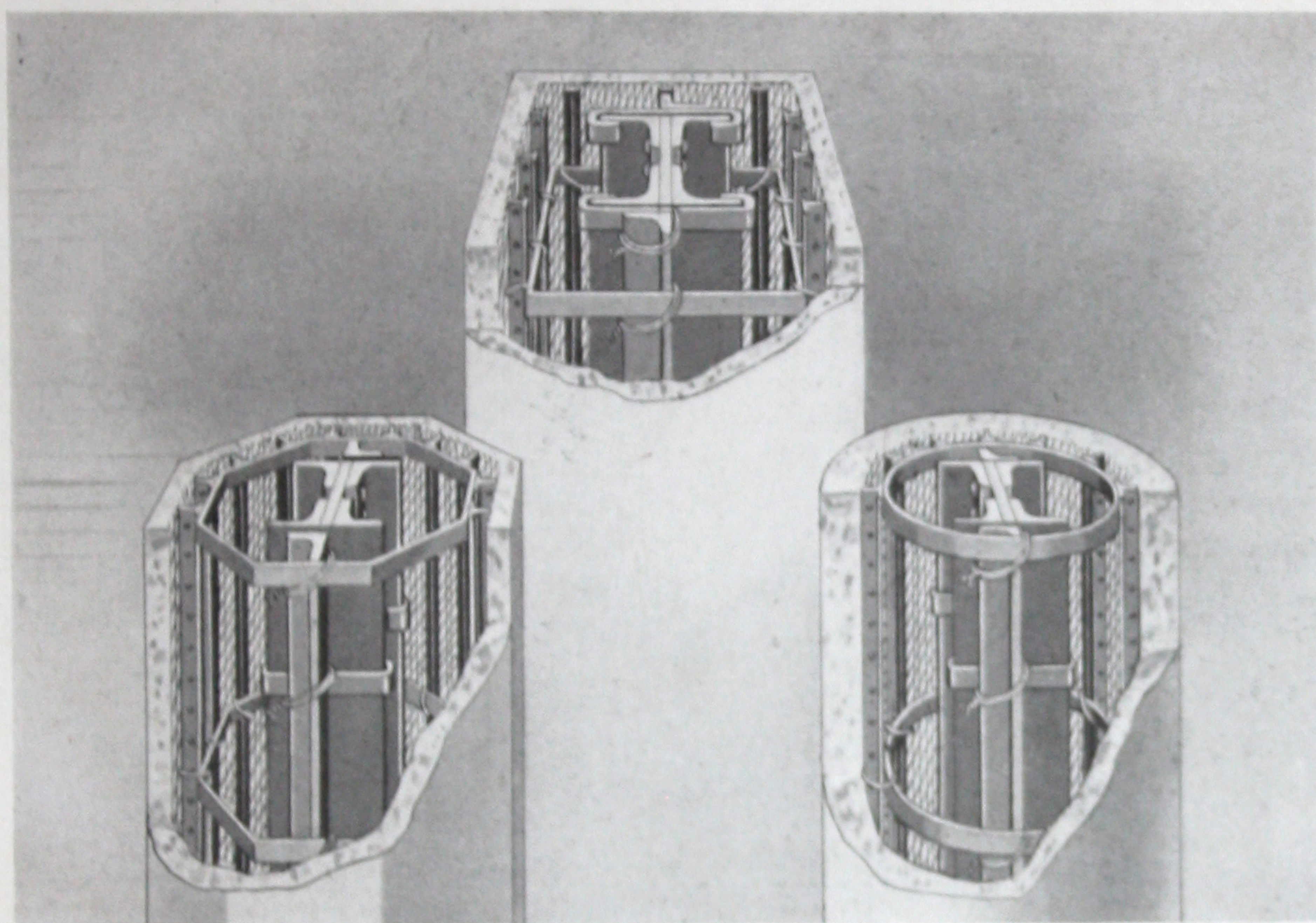
T-RIB CHANELATH

T-Rib Chanelath For Shower Baths, Toilet Rooms, Etc.



T - RIB CHANELATH

T-Rib Chanelath for Column Protection

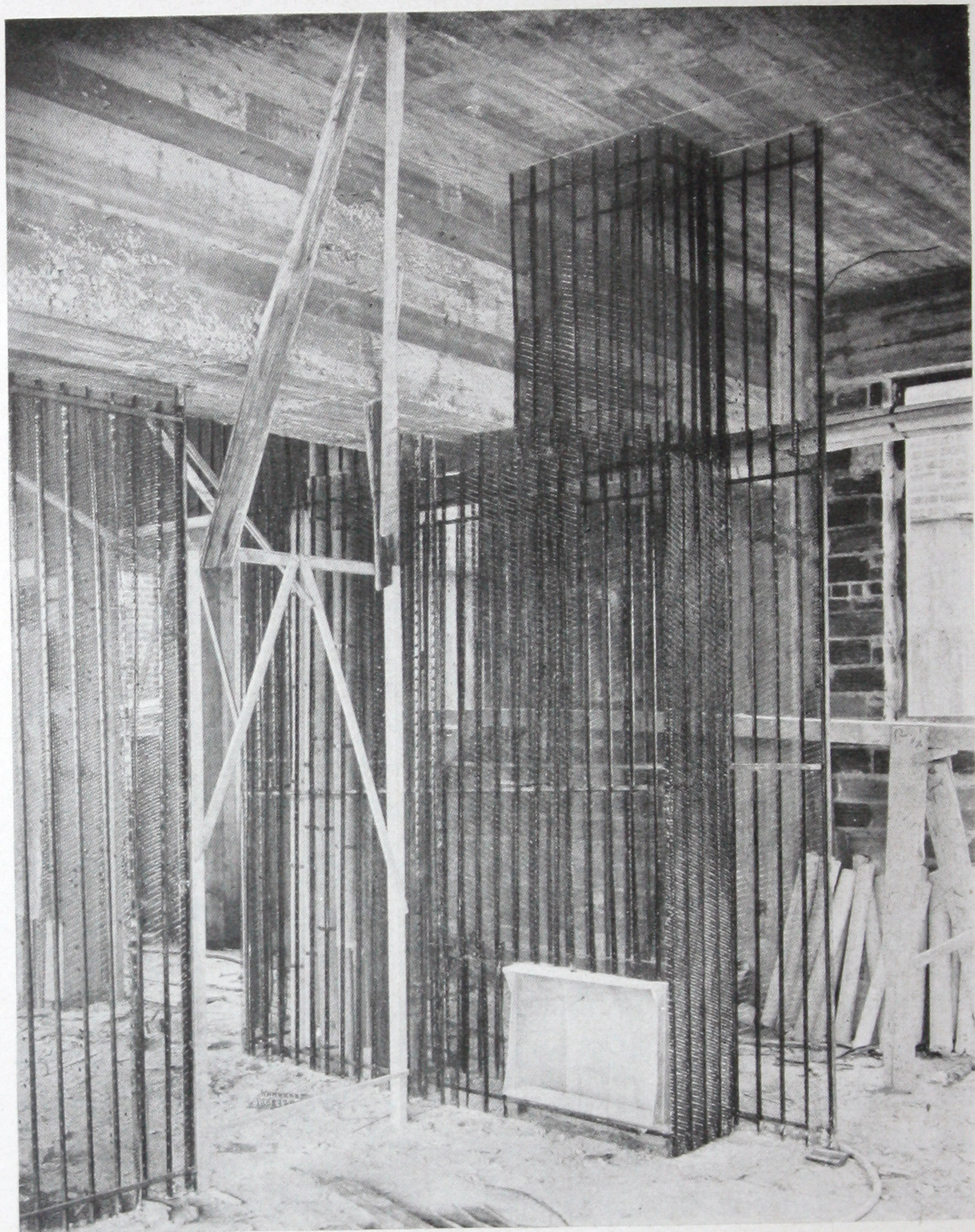


One of the requirements for fireproof construction is the enclosing of all steel columns with some fire-resisting construction. Experienced engineers recommend the use of a construction that will permit an air space between the structural steel and the fireproofing, having the least possible connection between the two. Chanelath is an ideal material for this purpose on account of the ease with which it may be shaped and the reinforcing value of the T-ribs. Methods of adapting Chanelath to various shapes of columns are shown in the illustration.

For false columns or posts, the Chanelath may be formed to the desired shape, secured in the desired position and plastered without other supports.

T - RIB CHANELATH

T-Rib Chanelath For Pipe Chases



A Method for Encasing Pipes and Air Ducts by Using T-Rib Chanelath

T - R I B C H A N E L A T H

T-Rib Chancelath Silos

Concrete silos are recognized as one of the necessary accessories for the operation of the present-day farm. Beginning as an adjunct to the dairy farm, their use is becoming more universal each year. Concrete eliminates many of the disadvantages of other types of construction, but it is objected to in many instances because of the excessive cost due to the use of curved forms and the time required in erection of a monolithic silo.

T-Rib Chancelath eliminates this difficulty. Chancelath is furnished for silo work with the sheets curved at our factory to the proper radius. The Chancelath furnishes sufficient reinforcement and only needs a very small amount of temporary bracing until the plaster has been applied. Portland cement plaster is then applied to both sides of the Chancelath. The completed silo wall is 3 or 4 inches thick, depending on the size of the silo.

T-Rib Chancelath Garages

To the owner interested in protecting his car, or to the builder interested in permanent and satisfactory building, Chancelath offers a means of economical, fireproof and permanent construction for concrete garages.

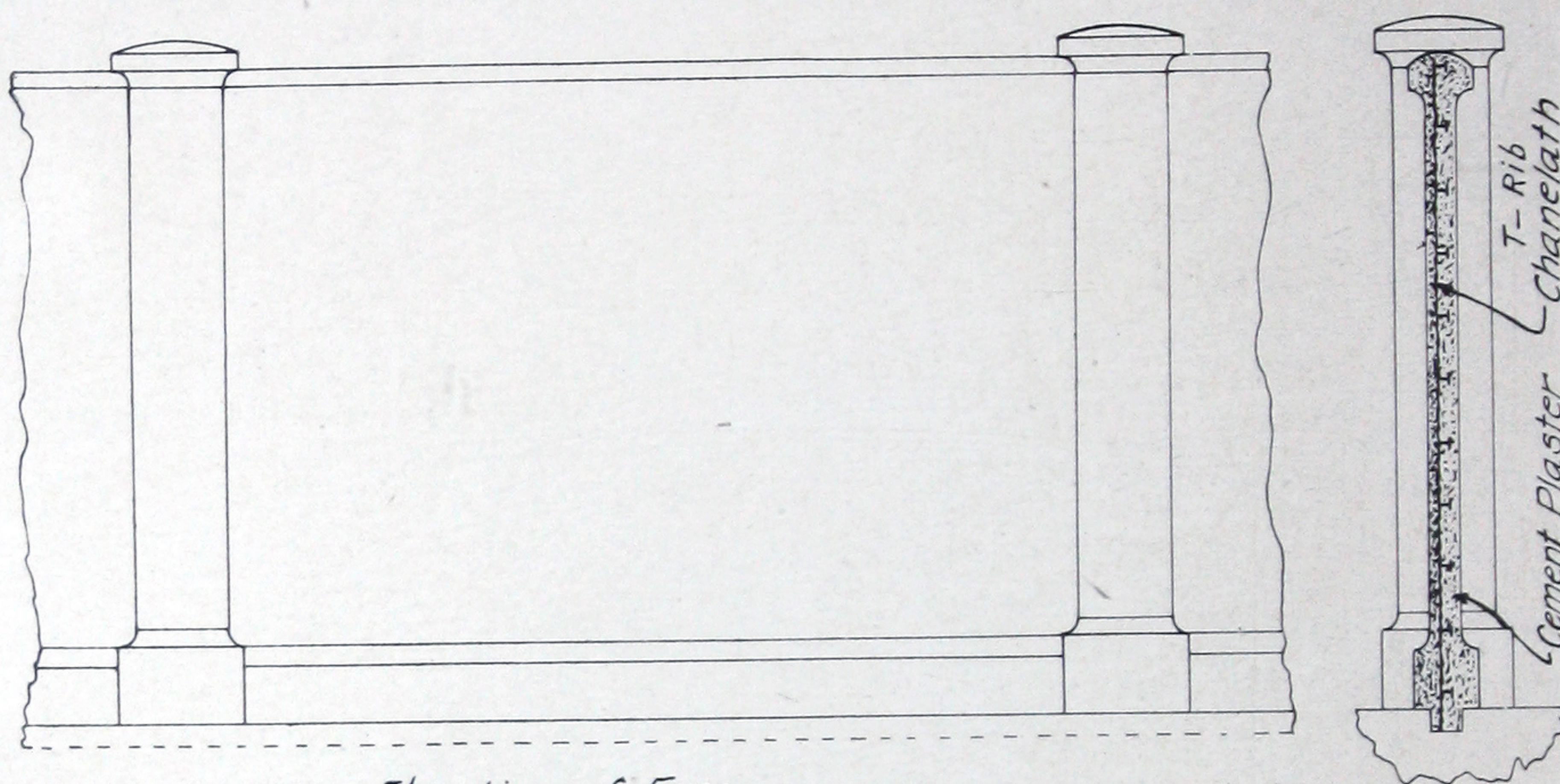
T-Rib Chancelath is used as the base for the concrete walls, which are of portland cement plaster. The Chancelath may be applied either to wood framing or steel. The wood will be slightly cheaper, but the steel will be fireproof if encased in concrete and will be the more permanent.

T-Rib Chancelath permits the construction of a light-weight but amply strong fireproof garage roof of concrete. On a small garage there will be no need for any special framing. On larger sizes a wooden or steel truss will be required.

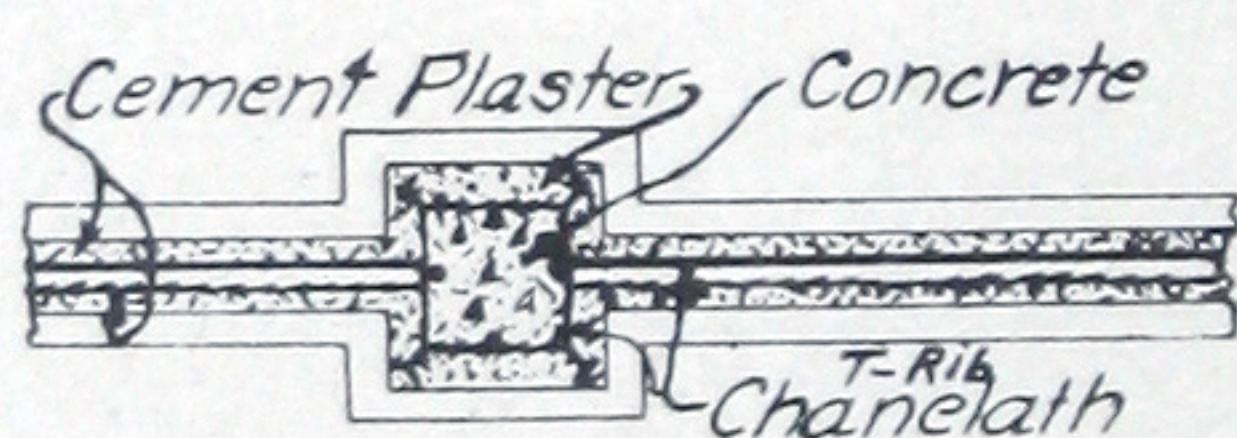
T - RIB CHANELATH

T-Rib Chanelath Fences

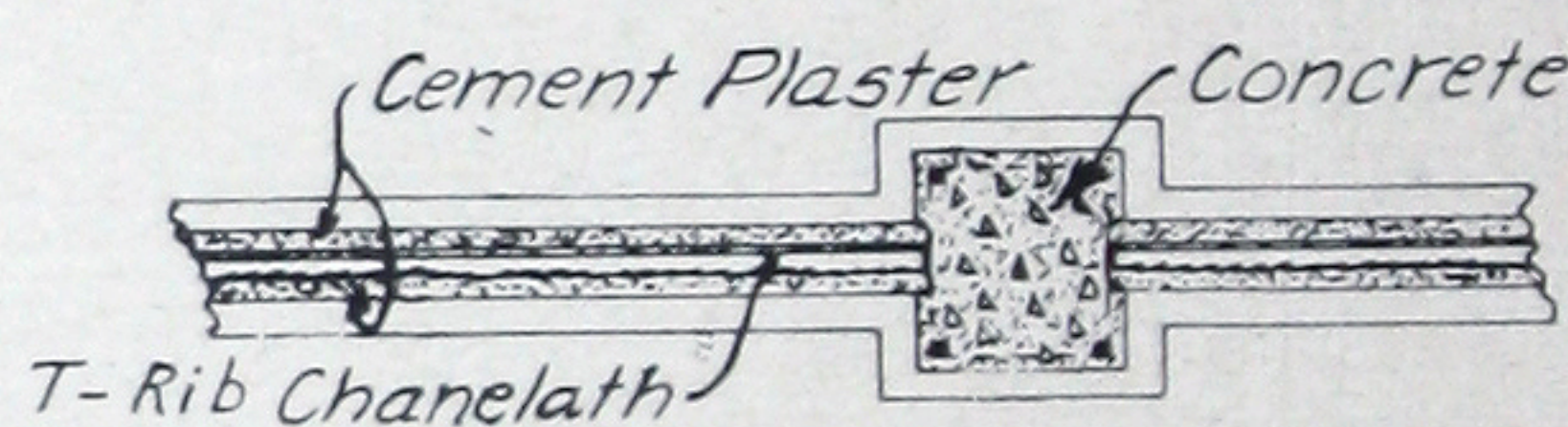
T-Rib Chanelath provides for the rapid and economical erection of concrete fences. The concrete fence is attractive and permanent, requires no repairs and does not have to be frequently painted.



Elevation of Fence



*Section showing Post
Made with Chanelath*



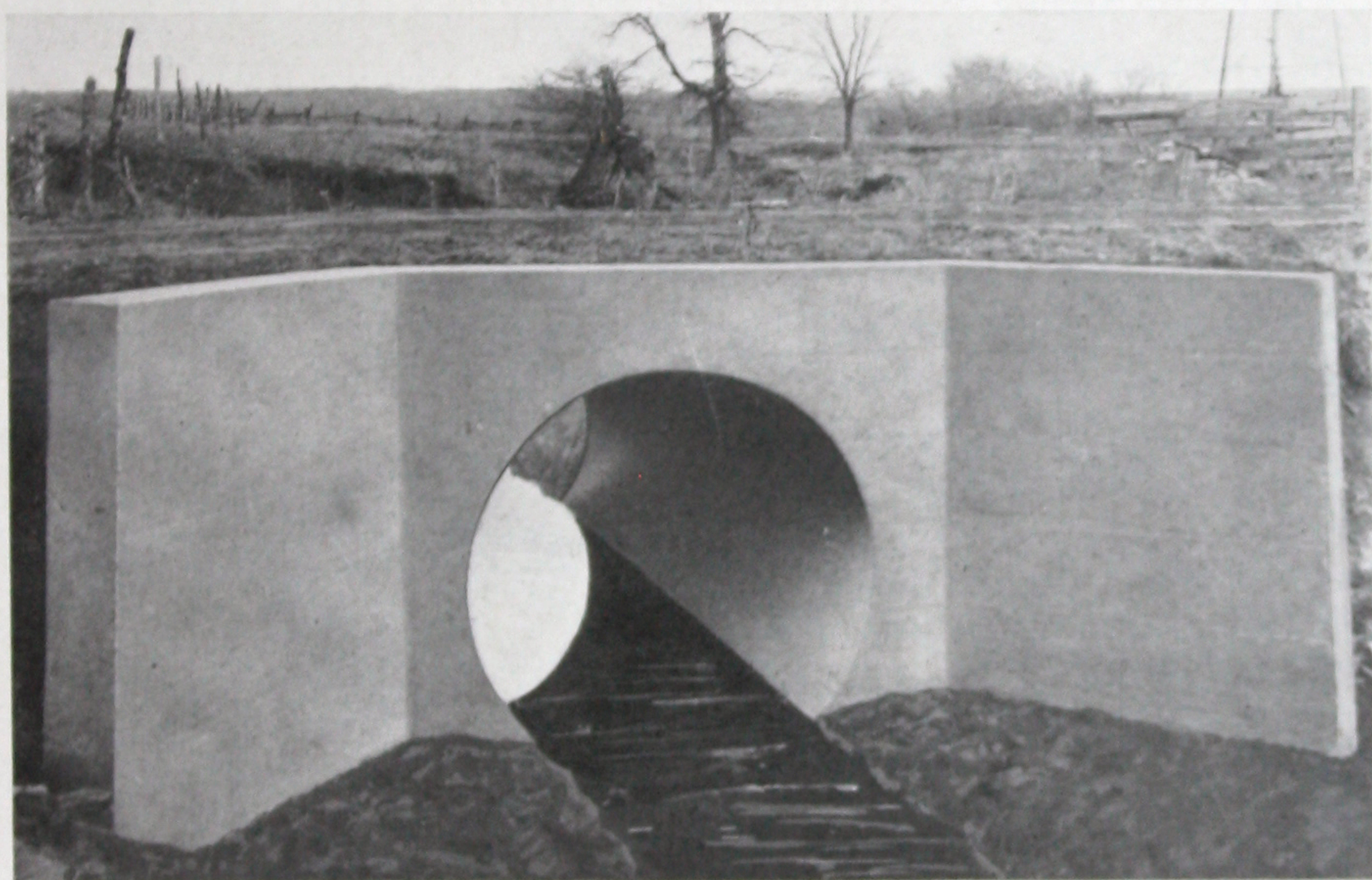
*Section showing Post
Made with Forms*

In using Chanelath for fences, two methods are followed. The posts may be made by using forms and leaving a slot for the insertion of the Chanelath after the concrete in the posts has set. The other and more effective method is to use Chanelath as a form for the posts, shaping it to the approximate size of the post and filling with concrete. The outside of the post can be plastered at the same time the plaster is applied to the Chanelath used for the panels between the posts.

T-RIB CHANELATH

T-Rib Chanelath Culverts

Many culverts are located in remote places, making it necessary to haul materials long distances over poor roads, and it is difficult to procure skilled carpenters in such a locality. All of these details tend toward an increase in the cost of formwork, and all of them are overcome by the use of T-Rib Chanelath.



T-Rib Chanelath is furnished curved to any desired radius over 24 inches, with the ribs on the outside of the arc. The excavation in shape outlines the outside form of the invert, and the complete cylinder of Chanelath is placed in its final position and supported properly at the crown by a plank on edge running the entire length, and braced securely to keep it from swaying or swinging. After the Chanelath is placed in position, the invert back of the Chanelath is poured and allowed to set until it is sufficiently strong to support the weight of the construction; the pouring of the outside of the crown follows, and finally the plastering of the inside, and the culvert is complete.

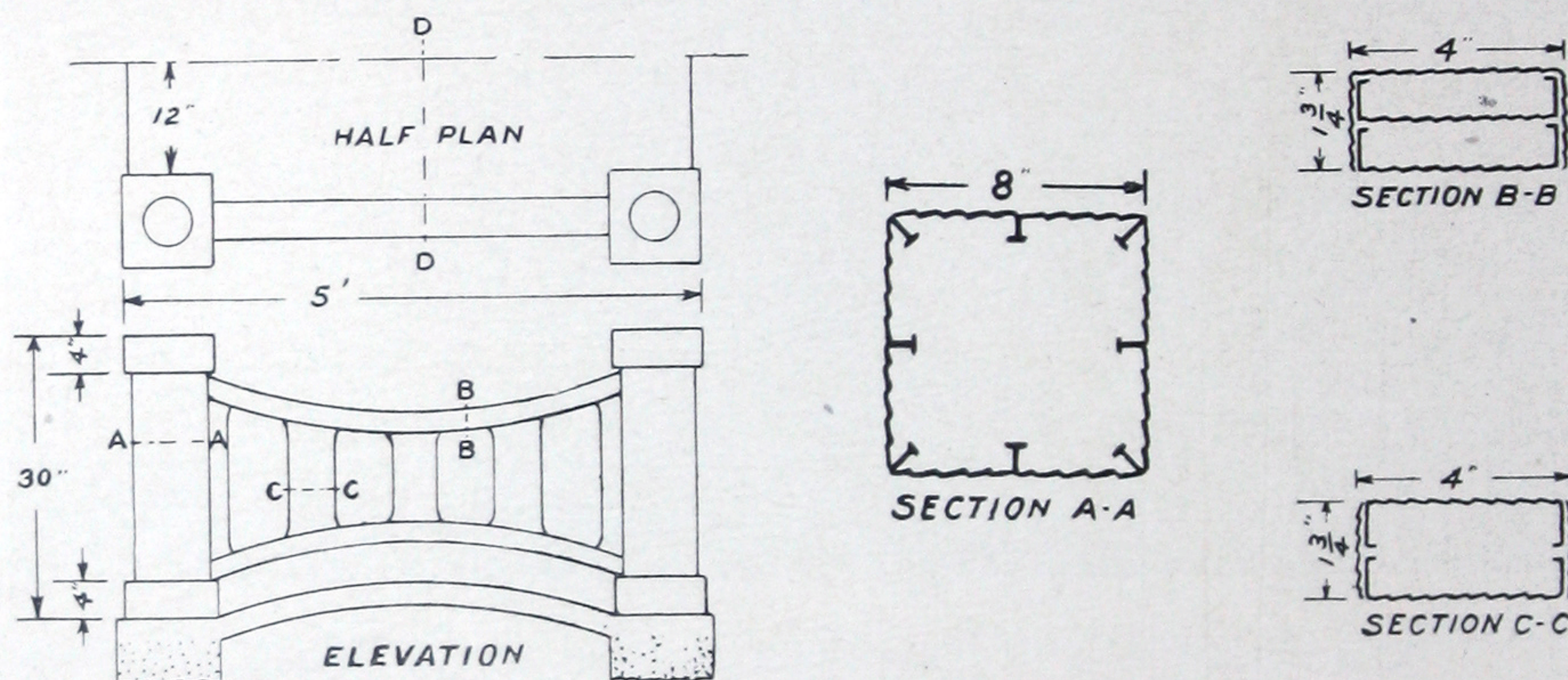
T-RIB CHANELATH

T-Rib Chanelath Bridges

T-Rib Chanelath can be used to an advantage in the construction of small bridges and for the ornamental parts of larger bridges.

The floor of the bridge is made by curving a sheet of T-Rib Chanelath to the desired radius and using this as a form for the floor. After the concrete has set the lath side of the Chanelath is plastered with portland cement.

The posts are formed from a sheet of T-Rib Chanelath, as shown in section A-A. The caps and bases of the posts are a section of T-Rib Chanelath 4 inches wide bent around the top and bottom of the frame for the body of the post.



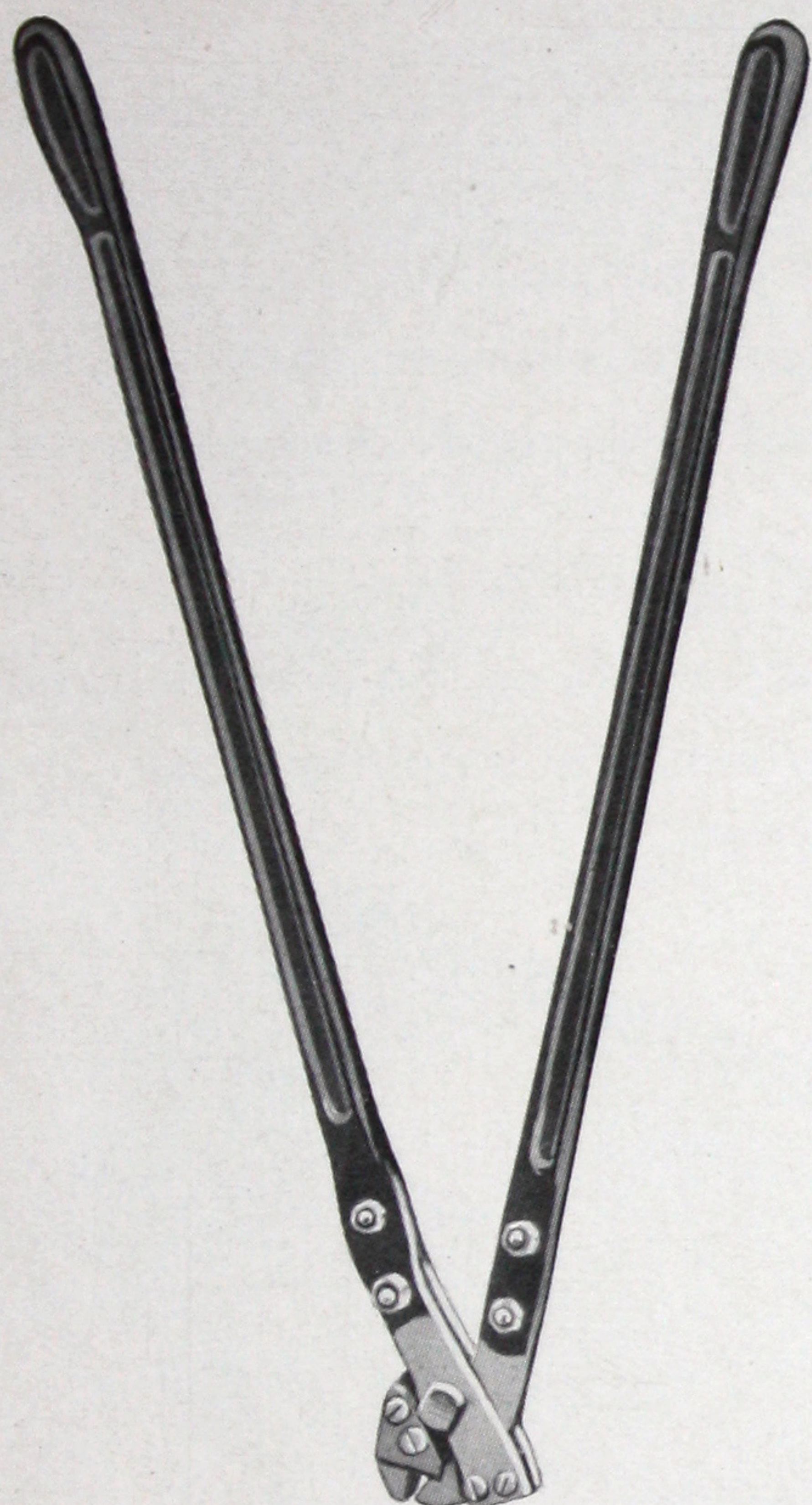
The upper and lower members of the railing are formed of two sections of Chanelath bent with the ribs on the outside of the arc, as shown in Section B-B.

In the vertical members of the railing, the sections of Chanelath have the lath side as shown in Section C-C.

The whole frame is carefully and securely wired together and plastered with three coats of portland cement. The finish coat is only trowelled sufficiently to give a fairly smooth surface so that the finished bridge has the appearance of tooled concrete.

T-RIB CHANELATH

T-Rib Chanelath Accessories



Chanelath Rib Cutter

Rib Cutter, for Cutting T-Rib Chanelath

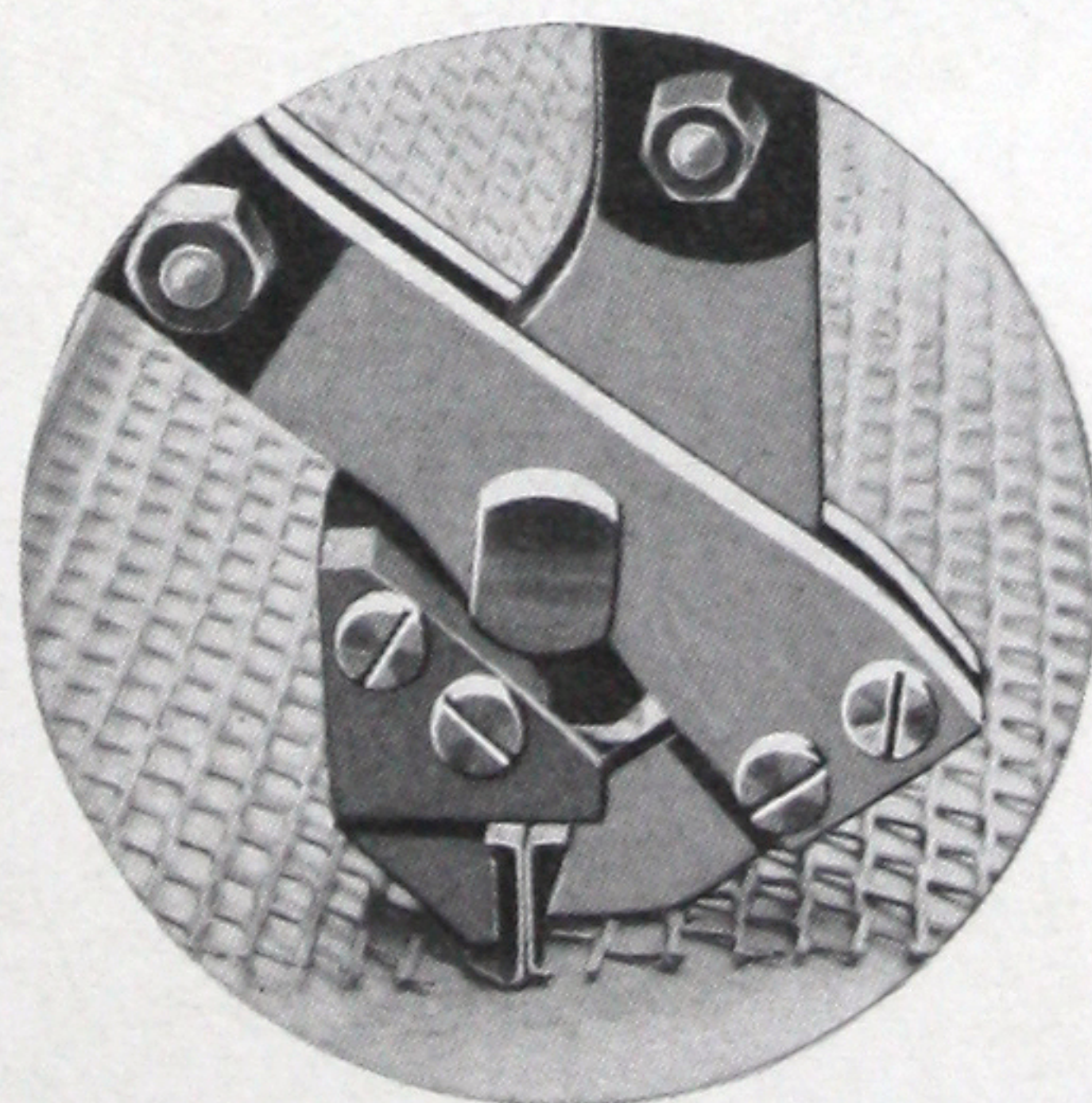
It is often necessary to cut the sheets of Chanelath on the job to make them fit around openings, angles, corners, and to cover irregular-shaped spaces.

This can be easily and quickly accomplished by the use of the rib cutter illustrated on this page and a pair of lathers' shears.

The ribs of the Chanelath are marked along the line of the desired cut and the rib cutter used to cut the ribs.

The cutter operates in a manner similar to a punch, cutting out a small section of the rib. This leaves a space for cutting the mesh with the ordinary lathers' shears.

The Chanelath rib cutter is furnished at the actual cost of the tool, and the purchaser will be allowed credit for this amount upon the return of the tool in good condition, if he does not care to keep it. Return express charges are to be paid by the user.



Detail of Cutter

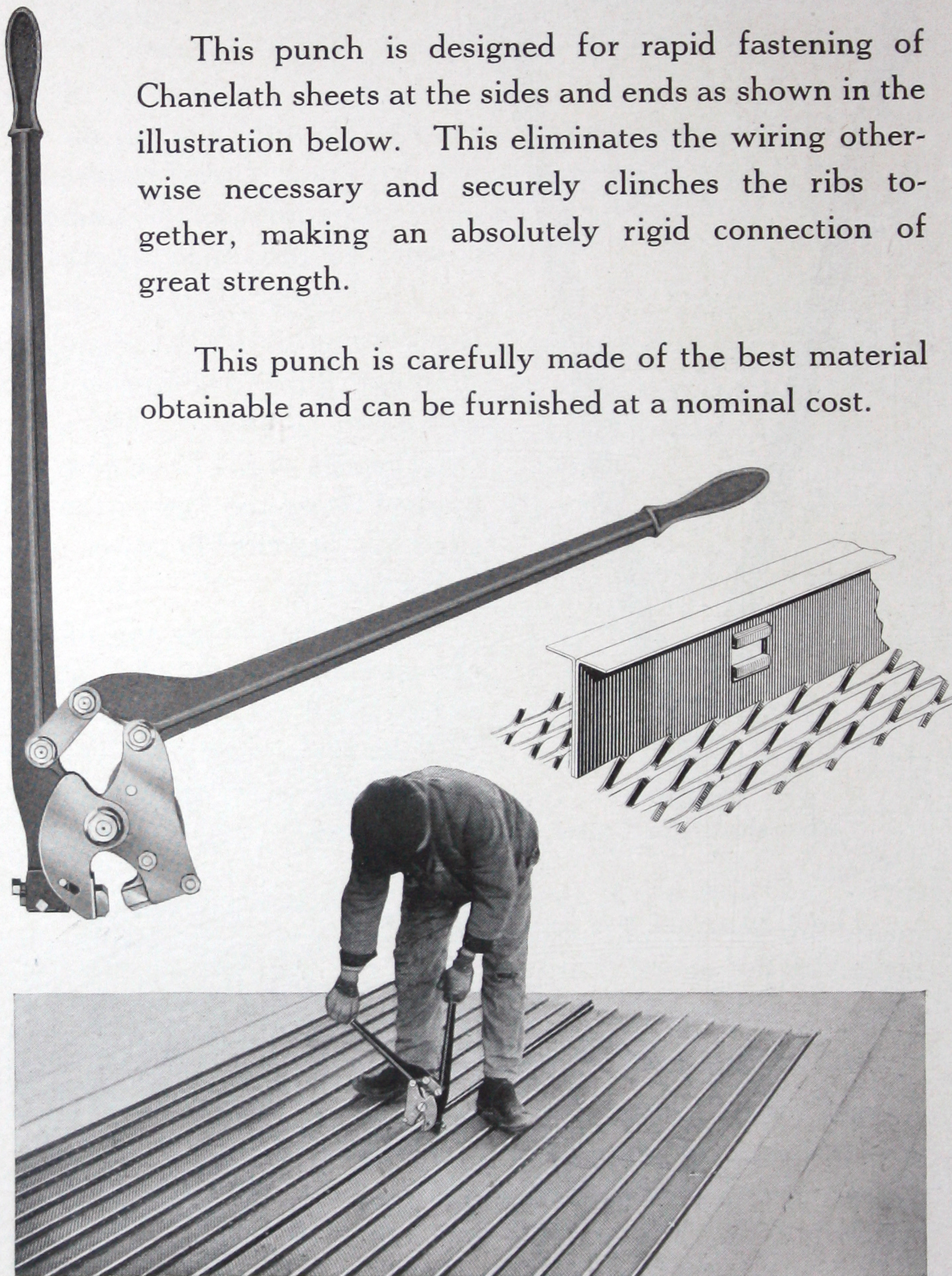
T - RIB CHANELATH

T-Rib Chanelath Accessories

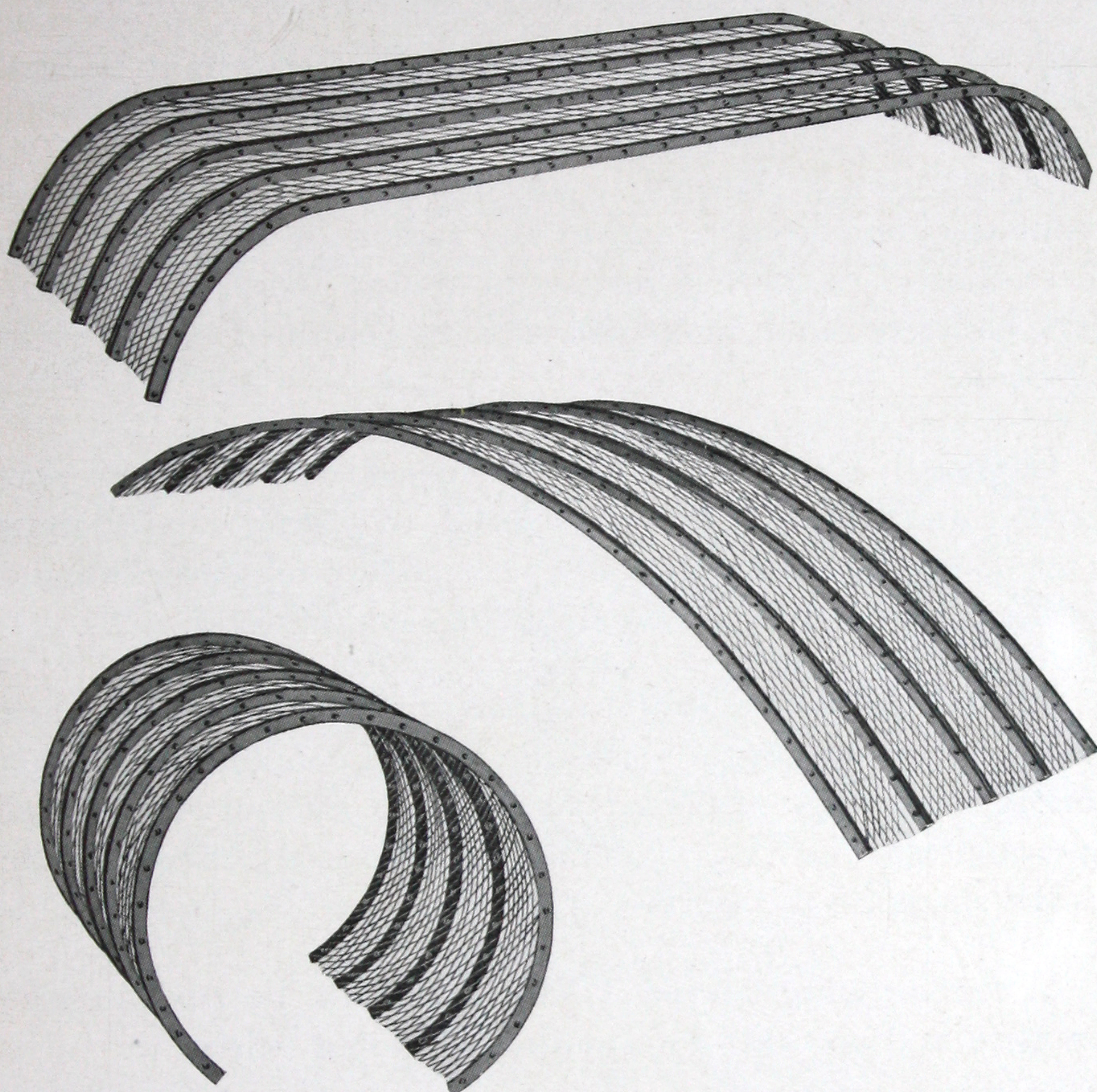
Chanelath Punch for Fastening Sheets

This punch is designed for rapid fastening of Chanelath sheets at the sides and ends as shown in the illustration below. This eliminates the wiring otherwise necessary and securely clinches the ribs together, making an absolutely rigid connection of great strength.

This punch is carefully made of the best material obtainable and can be furnished at a nominal cost.



Curved T-Rib Chanelath



The use of concrete for any construction circular or curved in shape has been very much restricted because of the excessive cost of making curved forms. T-Rib Chanelath presents a solution of this problem by combining in one material the form and the reinforcing for all types of curved concrete.

T-Rib Chanelath can be furnished from our factory curved to any desired radius from 24 inches up. The sheets are shaped with the ribs on the outside of the arc, by means of special machinery which can be accurately adjusted and which insures a uniformity of curve that cannot be obtained by any other method.

T - RIB CHANELATH

Curved T-Rib Chanelath—Cont.

Some of the shapes to which T-Rib Chanelath may be bent are illustrated on page 73. These may be varied as follows:

Sheets may be formed to any portion of a circle up to a complete circumference, and to any radius 24 inches or more. These sheets are suitable for use in arched floors, sewers, culverts, concrete pipes, tanks and silos, as described elsewhere in this book.

Chanelath sheets can also be furnished with the center portion flat and one or both ends curved, to meet special designs or for use in floor construction where it is desirable to eliminate the sharp angles between the floor slabs and the beams.

T-Rib Chanelath does not require any special shaping when it is used as a support for plastering around columns, as for this work the ribs will be placed vertical and the curvature is at right angles to the ribs. The mesh can be easily curved to the desired shape on the work.

When ordering curved T-Rib Chanelath, be sure to give complete and accurate information, as noted below:

For complete circles—the radius.

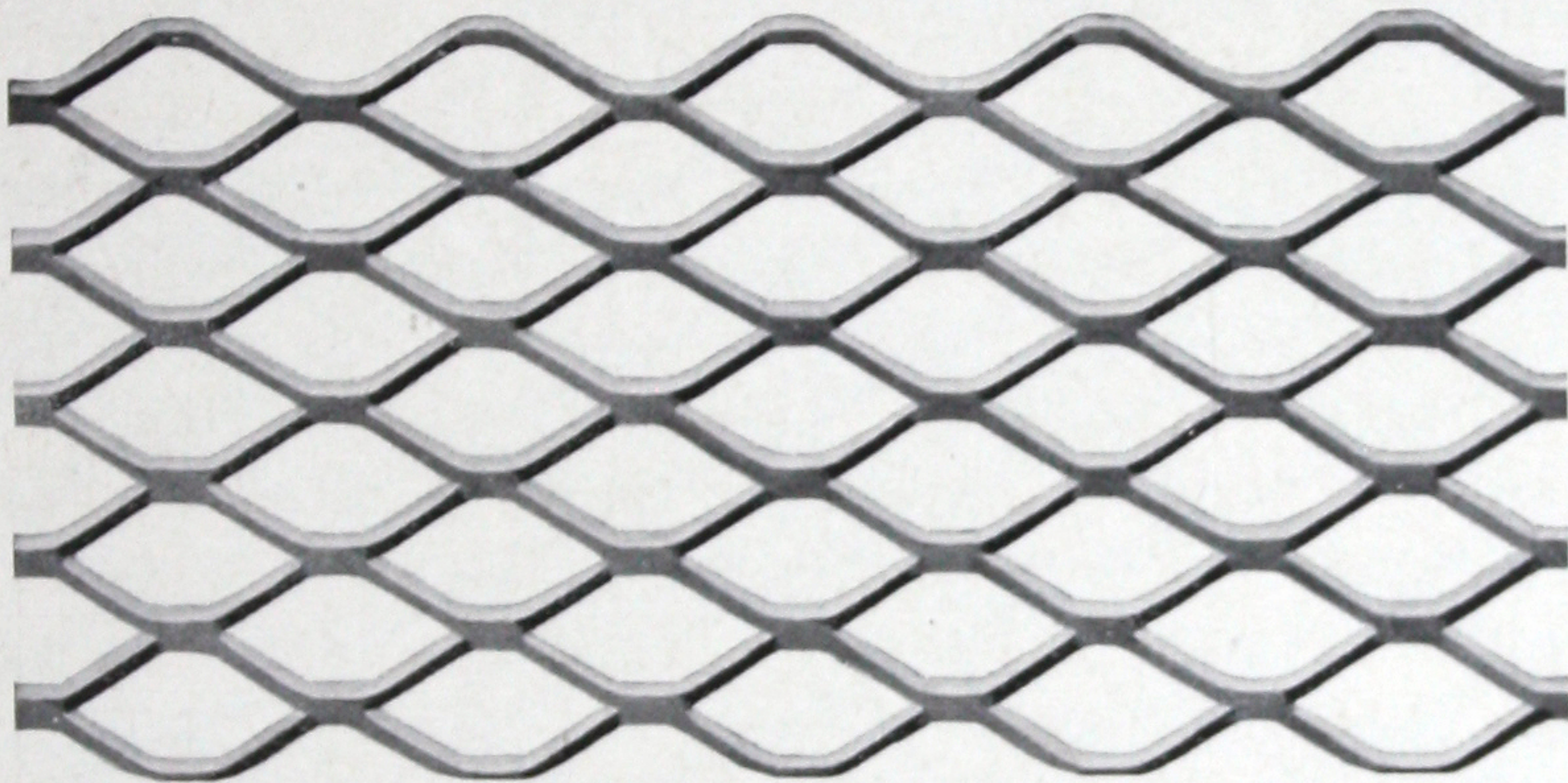
For parts of circles—the radius and the length of arc or piece; or, the radius and the chord or span of the arc; or, the rise of the arc at the center of the span and the chord or span of the arc.

For flat arches with curved ends—distance center to center of beams and the total height of the beams. Also the vertical distance from the bottom of the beam to the Chanelath at the center of the span, or the radius to which the ends are to be curved.

T - R I B C H A N E L A T H

Kno-Burn Expanded Metal Lath

Metal lath is a metal fabric designed as a base on which is to be applied any plastic covering for walls or ceilings. Metal lath is fireproof, and when used in conjunction with an incombustible plaster, provides an excellent protection for the structural parts of the building as well as providing a fireproof wall-covering.



Actual Size of Kno-Burn Mesh

Stock Sizes and Weights of Kno-Burn

No.	Width of Sheets	Length of Sheets	Sheets per Bundle	Yards per Bundle	Weight per Bundle	Weight per Yard
24-ga.	18"	96"	9	12	40.8 lbs.	3.4 lbs.
25-ga.	18"	96"	9	12	36.0 "	3.0 "
26-ga.	18"	96"	9	12	30.0 "	2.5 "
27-ga.	18"	96"	9	12	28.0 "	2 $\frac{1}{3}$ "

All gauges furnished painted.

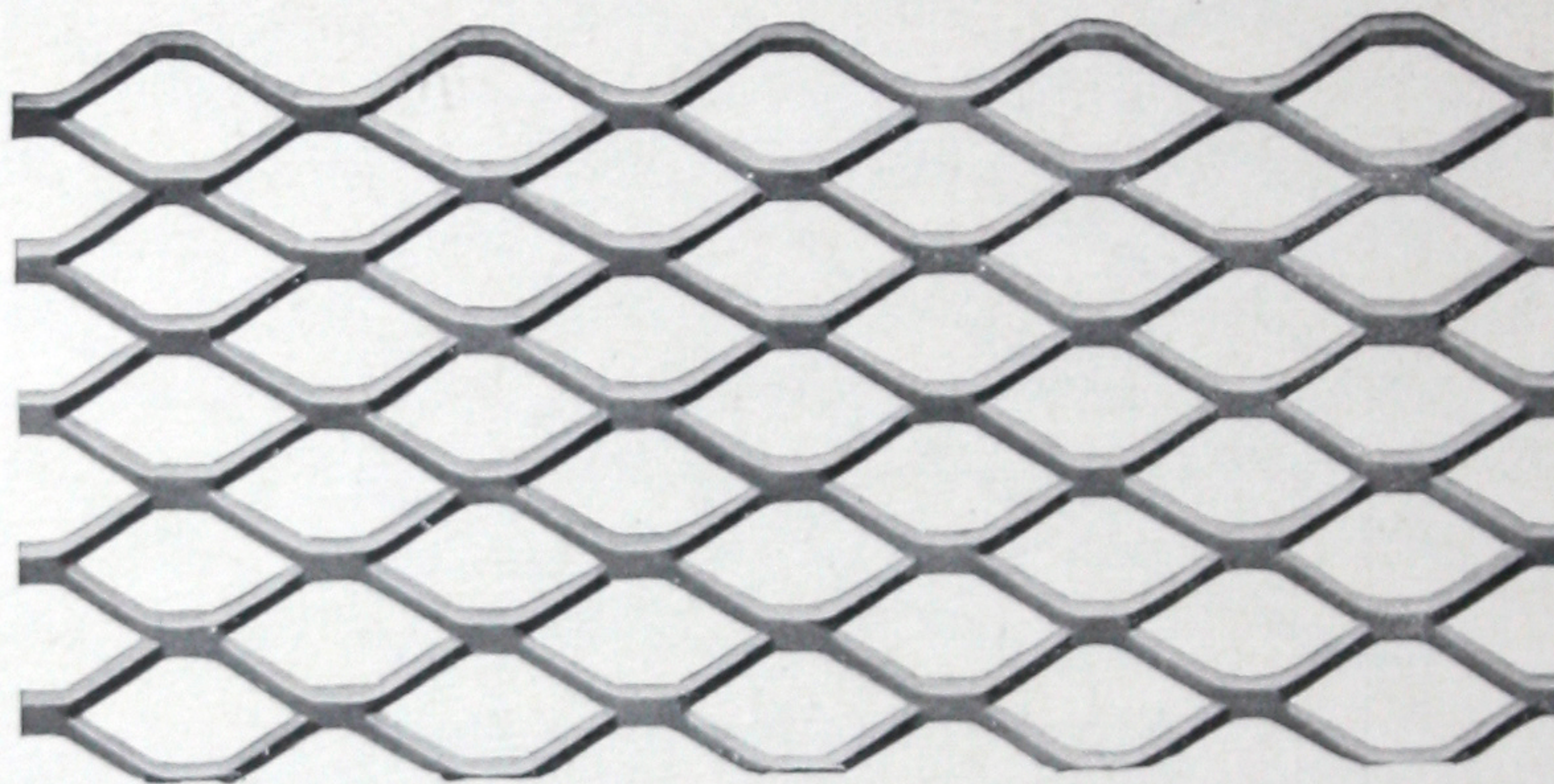
Regular size of sheets 18"x96".

Special size 24"x96", 16 yards per bundle, can be furnished.

T - RIB CHANNELATH

XX Century Expanded Metal Lath

XX Century is a type of Kno-Burn metal lath having identically the same mesh as shown in the illustration on this page. The difference is that XX Century is manufactured from a special sheet metal of a composition that is proof against acid corrosion and consequently is not so quickly affected by any kind of corrosion. It is particularly designed for use in connection with any plaster that contains acids and wherever the finished work is subject to dampness.



Actual Size of Mesh of XX Century Lath

Stock Sizes and Weights of XX Century Lath

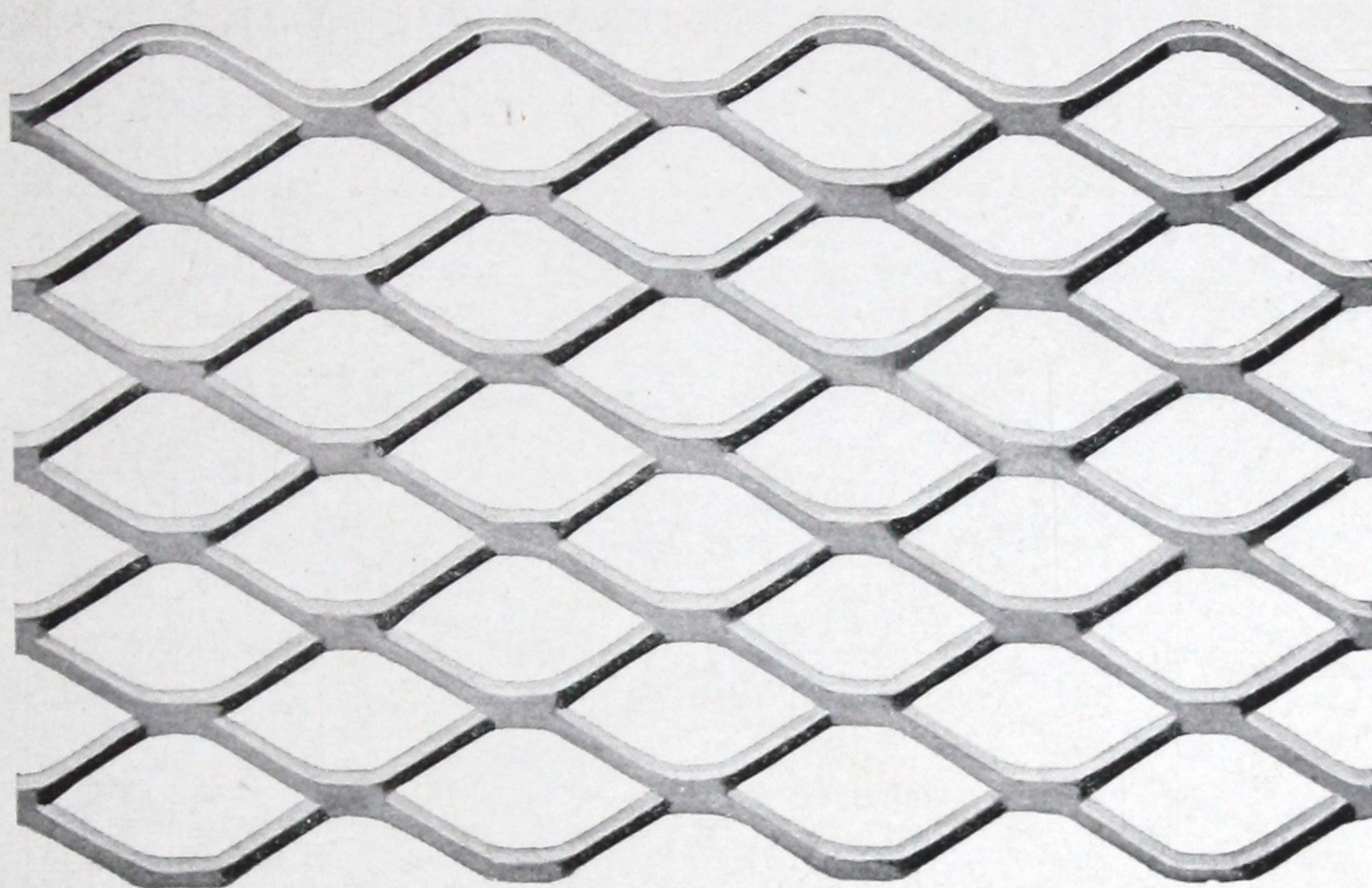
No.	Width of Sheets	Length of Sheets	Sheets per Bundle	Yards per Bundle	Weight per Bundle	Weight per Yard
24-ga.	18"*	96"	9	12	40.8 lbs.	3.4 lbs.
25-ga.	18"*	96"	9	12	36.0 "	3.0 "
26-ga.	18"*	96"	9	12	30.0 "	2.5 "
27-ga.	18"*	96"	9	12	28.0 "	2 1/3 "

*Can be furnished 24 inches wide, 16 yards per bundle.

T - RIB CHANNELATH

Eureka Metal Lath

Eureka lath is a type of lath having a mesh with the same shape as the Kno-Burn mesh, but having a slightly larger opening. The strands of the meshes are the same width, so the material retains its strength. For many kinds of plastering work it is not necessary to have a small mesh lath.



Actual Size of Eureka Mesh

Stock Sizes and Weights of Eureka Lath

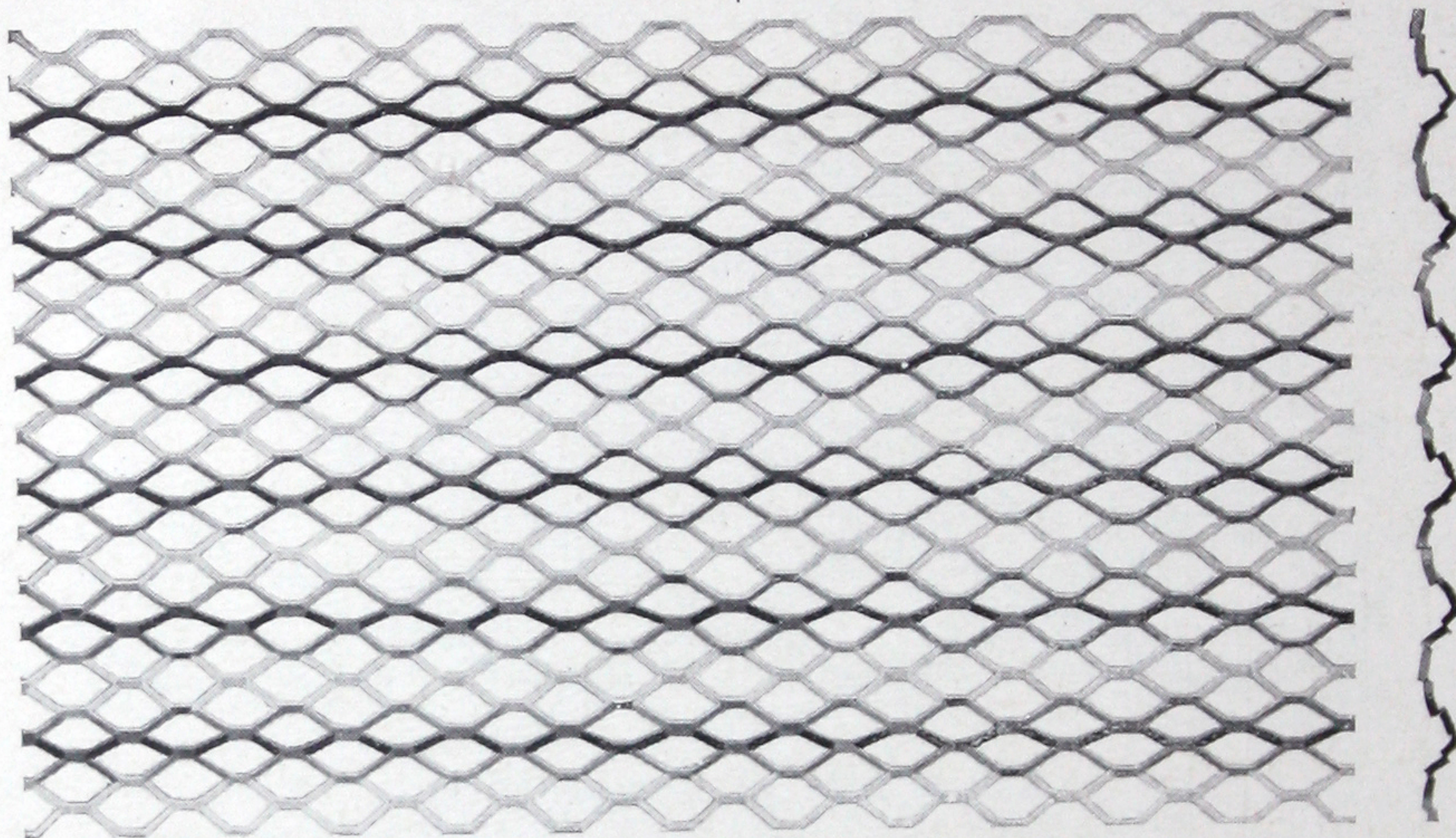
No.	Width of Sheets	Length of Sheets	Sheets per Bundle	Yards per Bundle	Weight per Bundle	Weight per Sq. Yd.
22-ga.	22"	96"	9	14 $\frac{2}{3}$	49. 8 lbs.	3.4 lbs.
24-ga.	22"	96"	9	14 $\frac{2}{3}$	41.04 "	2.8 "
26-ga.	21"	96"	9	14	30.08 "	2.2 "

All gauges can be furnished painted with either asphaltum or carbon paint. We recommend the carbon paint.

T - RIB CHANNEL LATH

Corrugated Expanded Metal Lath

Kno-Burn, Eureka and XX Century laths when used as a base for stucco over sheathing or when used in conjunction with wood studding, require furring so that the plaster can flow through the meshes and "key." Wood furring strips swell and shrink with changes in the weather and cause cracks. Metal furring strips increase the time and labor required in erecting the lath.



Section of Corrugated Kno-Burn, Eureka or XX Century

The corrugations in this material are $\frac{1}{4}$ inch deep and are spaced 1 inch apart running lengthwise of the sheets. These corrugations being open meshes will completely imbed in the plaster and insure a perfect "key" over the entire plastering surface. They add materially to the reinforcing value of the lath.

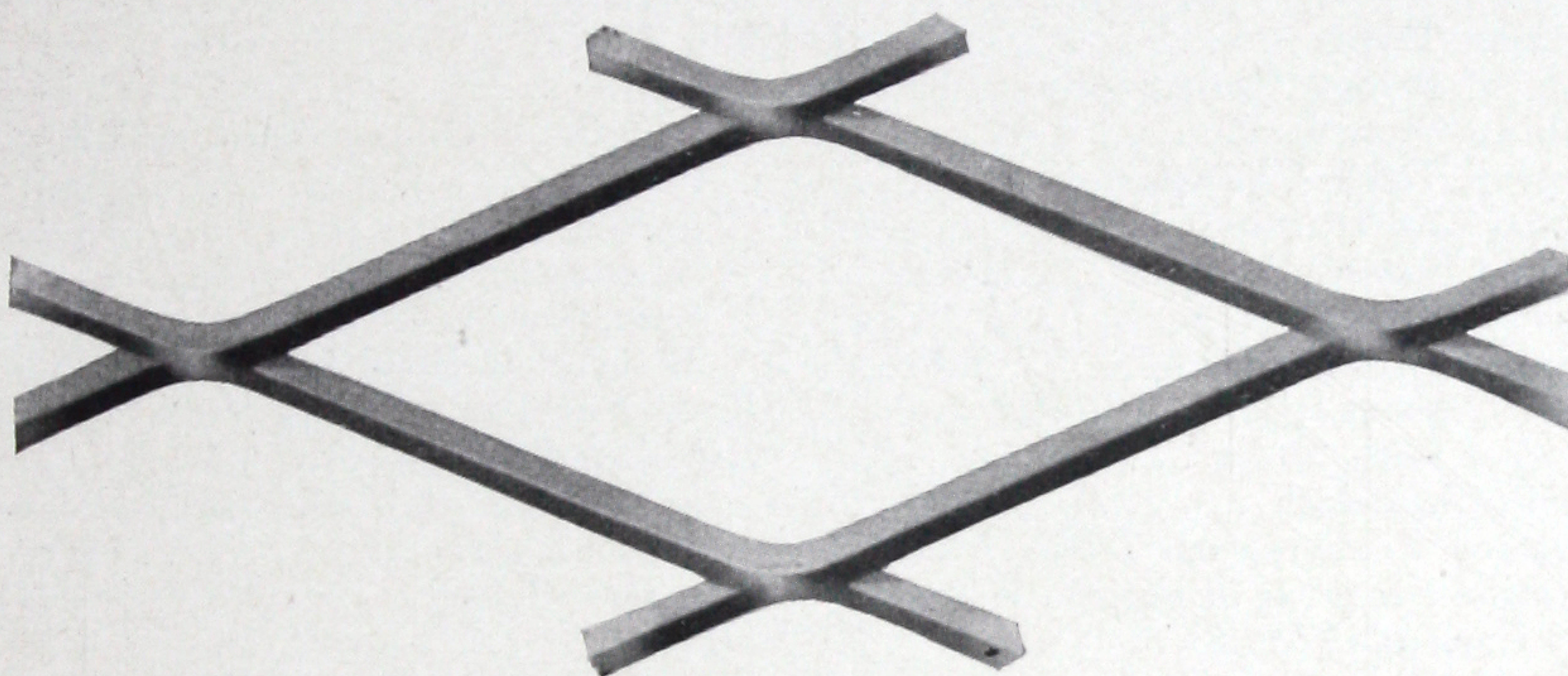
Stock Sizes and Weights

These are the same as those given on pages 75, 76 and 77.

T - RIB CHANNELATH

Econo Expanded Metal Reinforcement

The principal assumption in reinforced concrete design is that the concrete and steel must be so bonded together that they act as one material. This is best accomplished by using a reinforcing steel that is designed to form a mechanical bond with the concrete. A steel fabric of properly shaped meshes permits the concrete to grasp the reinforcing steel like fingers through a net. Such a perfect bond is secured when Econo steel reinforcing is used.



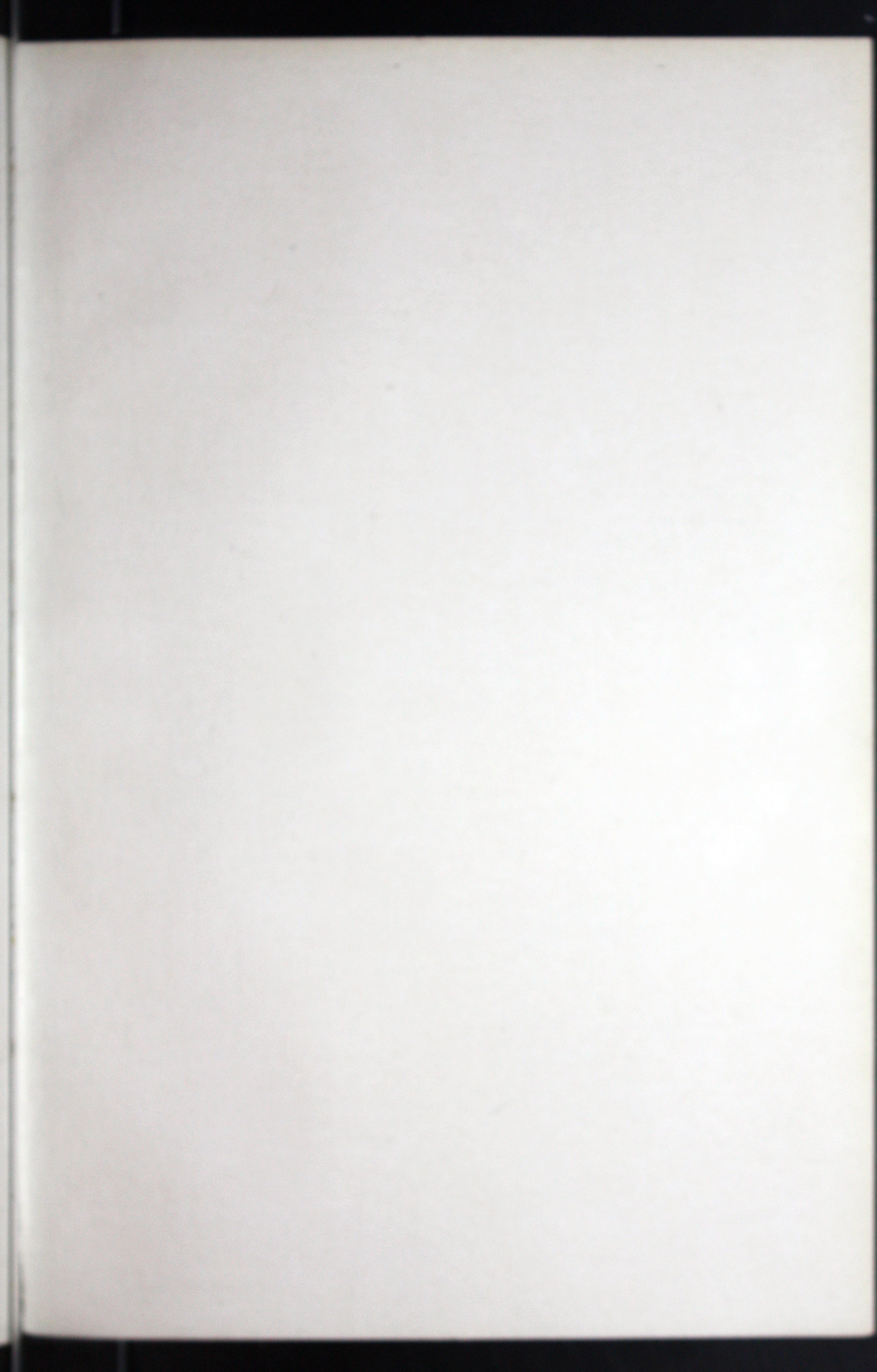
Typical Mesh of Econo

In the design of reinforced concrete, the steel is intended to carry all of the tensional stress. The steel used as a reinforcing must be of a quality that will resist high tensional stresses without stretching, for as soon as it begins to stretch, the bond between it and the concrete will be broken and the structure will fail to carry the load. Econo expanded steel reinforcing is manufactured from a high-grade steel and will resist very high stresses because of its high, elastic limit, produced by the cold drawing of the strands during the process of manufacture.

Full information as to stock sizes and weights for Econo from areas of .06 to .60 will be sent on request.

INDEX

	Page		Page
Arched Floors	20	Lap at Ends of Sheets (See Splicing) ..	17
Area of Steel in T-Rib Chanelath.....	9	Loads Carried by Arched Floors ..	20
Bond of T-Rib with Concrete... 4 and	17	Loads Carried by Slabs.....	18 and 19
Bridges	70	Load Tests of Slabs	39 to 42
Ceilings	47 to 51	Locker Construction	62 to 64
Details of Construction .. 49 and	50	Maximum Spans for T-Rib Chane-	
Specifications	51	lath	18 and 19
Weight of Ceiling Materials.....	22	Maximum Spans for Temporary Sup-	
Centering for T-Rib Chanelath.....	23	ports	23
Clips for Erecting T-Rib Chanelath..	12	Ordering T-Rib Chanelath	9
Column Protection.....	65	Partitions	52 to 57
Corners Formed with T-Rib Chane-		Details of Construction.....	
lath	14	 13, 53, 54 and 55	
Corrugated Metal Lath.....	78	Saving in Floor Space.....	53
Crating T-Rib Chanelath	10	Sizes of T-Rib Chanelath to Use..	51
Culverts	69	Specifications	57
Curtain Walls	59	Temporary Bracing	55
Curved T-Rib Chanelath	73	Properties of T-Rib Chanelath.....	9
Cutter for T-Ribs.....	71	Punch for T-Rib	72
Data for Ordering.....	9	Punching T-Rib Chanelath Sheeth..	72
Data for Specifying.....	9	Reinforced Concrete Design	15
Deflection Tests	41	Rib Clips	12
Designing Data.....	15	Rib Cutter	71
Details of Bridge Construction.....	70	Roofs	24 to 28
Ceiling Construction..... 49 and	50	Details of Construction .. 27 and	28
Curved T-Rib Chanelath.....	73	Flat	27
Fence Construction.....	68	Safe Loads	18 and 19
Floor Construction	29 to 32	Sawtooth	27
Locker Construction	62	Specifications	44
Partition Construction..... 53 to	55	Weight of Roof Materials	22
Roof Construction	27 and 28	Roof Purlins, table of sizes.....	21
Shower Bath Stalls	64	Safe Loads for Arched Floors.....	20
T-Rib Chanelath	9	for Flat Slab Floors... 18 and	19
Distinctive Features of T-Rib 5 and	6	for Roofs	18 and 19
Distinctive Features of the Mesh 7 and	8	Seepage Tests.....	37 and 38
Econo Expanded Metal	79	Silos	67
Eureka Metal Lath.....	77	Sizes and Weights of T-Rib Chanelath	9
Expanded Metal Runner Angle.....	13	Slab Tests	34 to 42
Expanded Metal and T-Rib Chanelath		Specifications for Ceilings	51
Floors	19 and 32	for Floors and Roofs.....	44
Exterior Walls	60 and 61	for Partitions	57
Fastening T-Rib Chanelath to Struc-		for T-Rib Chanelath	9
tural Steel	12	Splicing Sheets of T-Rib Chanelath	11
Fences	68	Strength Test	39 and 40
Finishing Concrete	45	Temporary Bracing for Partitions... 55	
Floors	29 to 46	Temporary Supports..... 23, 28, 43	
Details of Construction	29 to 32	Tests	34 to 42
Safe Loads	18 and 19	T-Rib Chanelath, Details of.....	9
Specifications	44	Description	3 to 8
Temporary Supports	23	Tables for Deflection Test	41
Tests of Floor Slabs	34 to 42	for Partitions	57
Weight of Materials Used for		for Safe Loads	18 to 20
Floors	21	for Seepage Test	38
Formulas for Designing Reinforced		for Sizes and Spacing of Purlins	21
Concrete	15 to 17	for Sizes and Weights of T-Rib	
Garages	67	Chanelath	9
General Uses of T-Rib Chanelath 3 to	5	for Strength Tests	42
Height of T-Rib.....	9	for Weight of Construction Ma-	
Kno-Burn Metal Lath	75	terials	22 and 23
Lap Required for Bond	17	Walls, Exterior	60 and 61
Lap at Sides of Sheets (not required)		Curtain	59
..... 45, 53 and 59		XX Century Lath	76





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